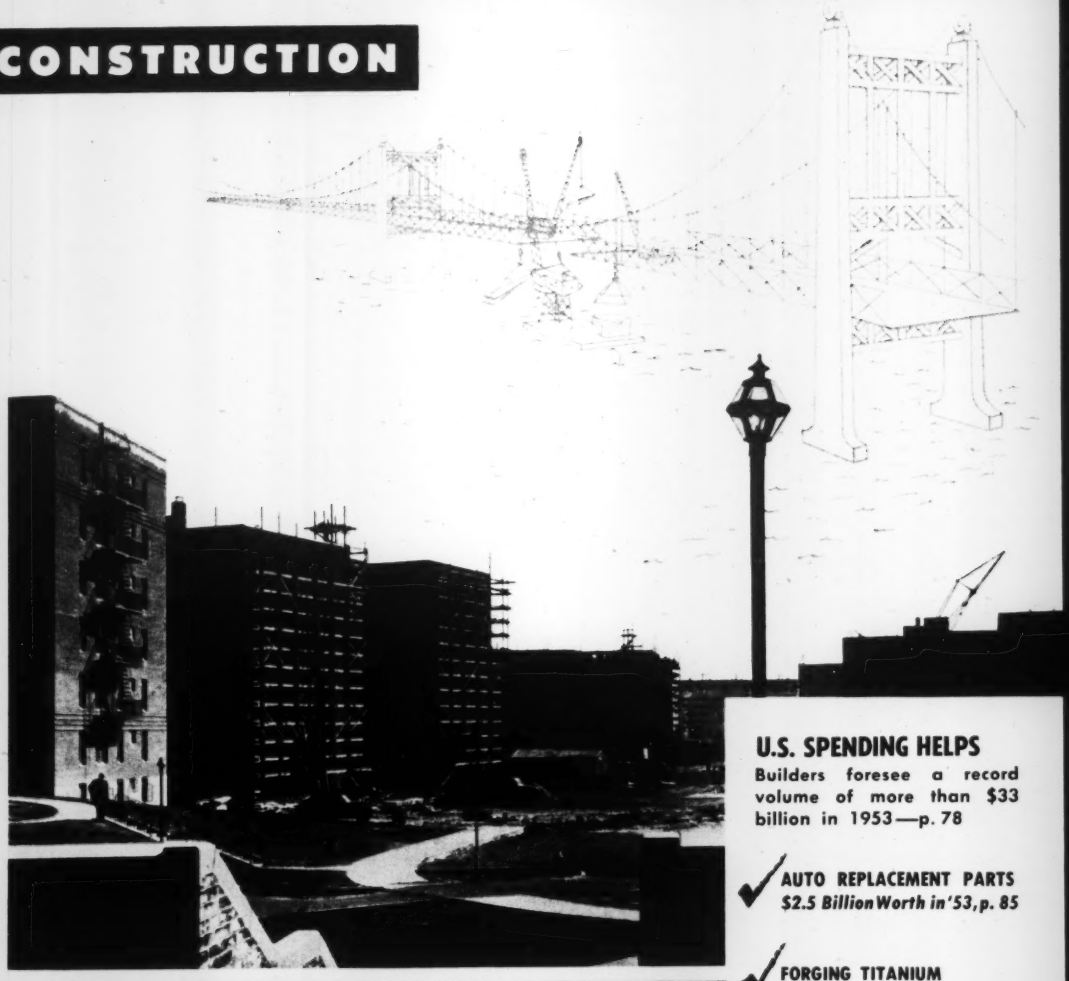
DECEMBER 15, 1952

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

CONSTRUCTION



U.S. SPENDING HELPS
Builders foresee a record volume of more than $33 billion in 1953—p. 78

✓ **AUTO REPLACEMENT PARTS**
$2.5 Billion Worth in '53, p. 85

✓ **FORGING TITANIUM**
Behavior is Different, p. 104

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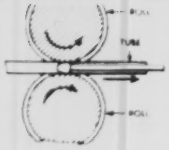
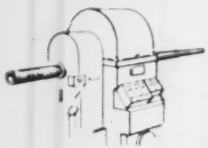
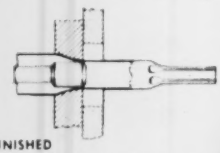


HOT-FINISHED
bears the scale formed during hot fabrication or heat treatment



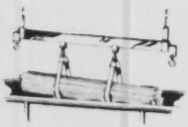
TURNED
machined, uniform O.D.

ROTO ROCKED
Smooth surfaces obtained by special sizing and finishing processes

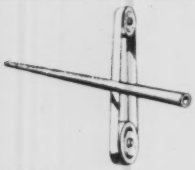


COLD DRAWN
Smooth, scale-free surface

COLD FINISHED



PICKLED
de-scaled by one of several solutions



POLISHED
O.D. and or I.D. polished to one of several specified degrees of smoothness

FLASH-IN
ERW tubing which retains the bead formed by welding.

FLASH REMOVED
ERW tubing, bead free. *Both available either as welded or normalized.*

take a closer look at YOUR Finishing Time

You aren't taking full advantage of the time savings and cost economies in the machining and fabrication of hollow parts from tubing *unless you start with tubing having the* ***PROPER SURFACE FINISH.***

By specifying tubing having a surface finish keyed to your production methods, you take an important step toward reducing the time it takes you to make your finishing operations.

As a specialty tube mill, B&W supplies mechanical tubing in the variety of surface finishes illustrated.

Your choice should be influenced by your production facilities and consideration of the cost differentials among the several finishes.

In any case, remember that the tubing *you* can use is more than merely bar stock with a hole in it.

It can be delivered to you as a product ready for you to convert—in the shortest possible time and with least cost—into your finished product. Mr. Tubes—your B&W Tube Representative can help you select the tubing and finish most suitable for your specific end uses.

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
General Offices & Plants
Beaver Falls, Pa.—Seamless Tubing, Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

Sales Offices: Beaver Falls, Pa. • Boston 16, Mass. • Chicago 3, Ill. • Cleveland 14, Ohio • Denver 1, Colo. • Detroit 26, Mich. • Houston 19, Texas • Los Angeles 17, Cal. • New York 16, N. Y. • Philadelphia 2, Pa. • St. Louis 1, Mo. • San Francisco 3, Cal. • Syracuse 2, N. Y. • Toronto, Ontario • Tulsa 3, Okla.

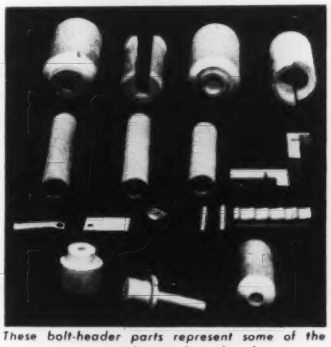
B&W SEAMLESS and WELDED TUBES

TA-1690M

Tool Steel Topics

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation



These bolt-header parts represent some of the many uses at our Lebanon, Pa., plant for our carbon tool steel of cold-heading quality. As a large user of our own tool steels, we gain valuable experience to help solve our customers' problems.

How Our Proving Ground Helps Tool Steel Users

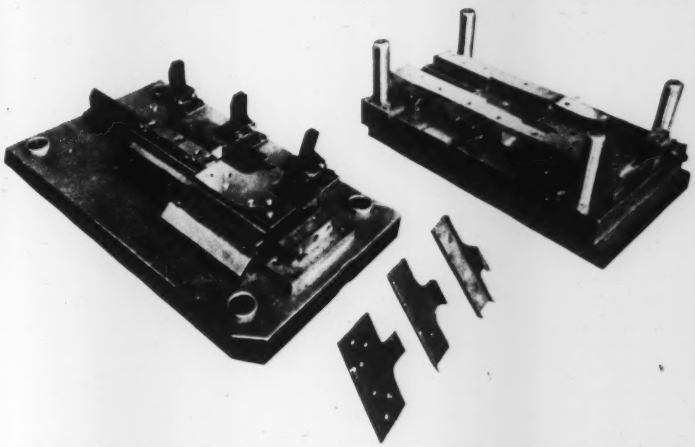
Many people think of a particular tool steel in terms of its chemical analysis. Others may classify it according to its properties. But when all's said and done, from the standpoint of the user a particular tool steel is one that does or doesn't do the job on a specific application.

We ourselves are one of our own largest tool steel customers. We use tons of Bethlehem tool steel every year. Our steel and manufacturing plants, our fabricating works and shipyards, make a vast proving ground, giving us very special opportunities to check up on our tool steel, watching it at work on nearly every kind of job imaginable.

That helps us — and our customers — in two ways. First, it yields the kind of first-hand practical experience in the treatment and application of the various grades of Bethlehem tool steel that can only be gained by living with them every day. Second, it provides a huge store of valuable information on tool design, heat-treatment, and tool and die performance.

All this helps not us alone but, as we say, helps us to help our customers to get the most out of tool steel. So if you have a problem in any way related to tool steel selection or treatment, we invite you to tell us about it. The chances are several to one that our experience can be helpful. It is yours for the asking.

Heavy-duty Die Packs 300-ton Wallop



This three-stage progressive die punches, shears, trims, and forms parts from steel plate in a 300-ton press. It turns out about 2500 each shift. All wearing portions of the die are made of 67 Chisel, our chrome-tungsten grade of shock-resisting steel. Hardened to Rockwell C-53, it produces upwards of 30,000 pieces before redressing is needed. The guard-rail clip angles, shown in foreground, are made from high-carbon steel plate of approximately .218 in. gage.

Renowned for its extreme toughness, 67 Chisel has excellent wear-resistance for a wide range of heavy-duty jobs. It's often used for punches, swaging dies, chipping chisels and machine parts subject to repeated shock . . . heavy shear blades for cold work and also for hot-work jobs up to 1000 F. And it's a popular choice for master hobs.

Tools made from 67 Chisel are readily carburized. This makes possible a very hard surface, reinforced by a core that's really tough.

67 Chisel is an easy steel to machine and heat treat. It's stocked in many sizes for quick shipment.

Its typical analysis:

C	*Si*	*Cr*	*W*	*V*
.50	.75	1.15	2.50	.20

BETHLEHEM TOOL STEEL ENGINEER SAYS:

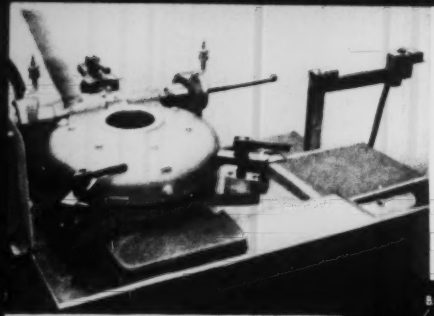
Keep those cutting tools sharp

In many shops the resharpening of production cutting tools is neglected too long. In an effort to keep output at a peak, such tools are sometimes kept in use beyond the point where the cutting edges become excessively dull.

Just what happens when edges are dull? For one thing, the dull edges begin to cause an increase in the load on the shearing or cutting edges. If the dullness is carried to extremes, tools will break. Dull cutting edges also produce rough surfaces on the parts; this may result in rejection due to defects or because the tolerances have been exceeded.

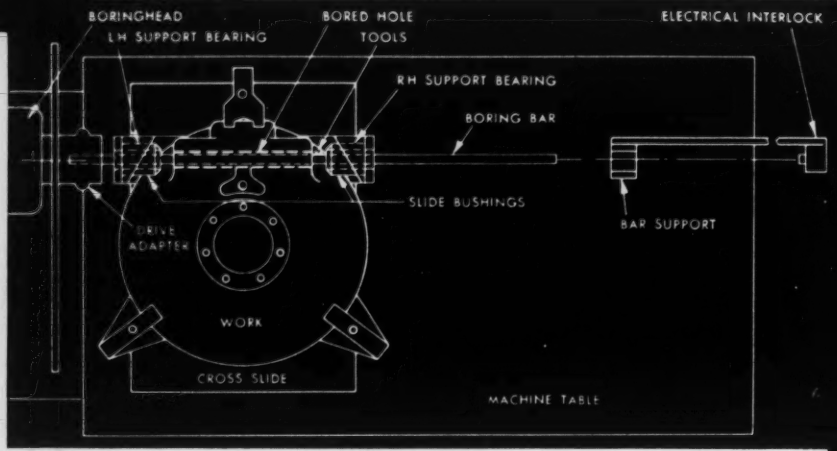
If resharpening is delayed too long, it may be impossible to recondition a tool properly. Deep spalls, cracks, and gouges cannot be removed. Usually there is an economic balance point on each type of operation where it is best to resharpen. This point must be determined for each operation. Regular inspection of tools will show any unusual conditions causing excessive dulling.

Preventive maintenance of cutting edges pays off in longer tool life and fewer broken tools.

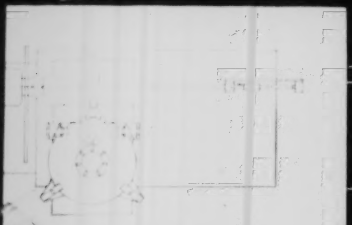


SEPARATE SUPPORT

solves long-bore problem



Plan view of tooling set-up utilizing separately supported boring bar for precision borizing of long, small-diameter holes.

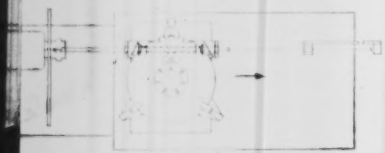


1. PART LOADED

With boring bar retracted to right, and cross slide in forward position, part is loaded and held in platen type hand strap clamping fixture.

2. BORING BAR INSERTED

With cross slide indexed to boring position, boring bar is inserted through support bearings and hole in work, and locked in place by drive adapter on beringhead. Only one set of tools is used so tools are not fed through work prior to boring.



3. BORING STROKE

As table is traversed to right, boring bar tools are, in effect, "pulled" through the bore. Table then out-bores left to eliminate drag line.

Heald Model 224 Bore-Matic with separate boring bar arrangement gives chatter-free finish to long, small-diameter holes

• Where the length to diameter ratio of a bored hole exceeds the limitations of a damped quill, a separate boring bar arrangement may provide an effective solution to the problem. The above set-up of a Heald Model 224 Bore-Matic for borizing large magnesium cases is a typical example.

The boring bar, while in operation, is supported in double outboard slide bearings, one on each side of the work. This provides ample rigidity for smooth, chatter-free borizing throughout the length of the bore. The boring bar cradle at the right of the table includes an electrical interlock switch so arranged that the bar must be completely retracted from the work before the cross slide can be indexed to the loading and unloading position.

Remember — when it comes to precision finishing, it pays to come to Heald.

HEALD

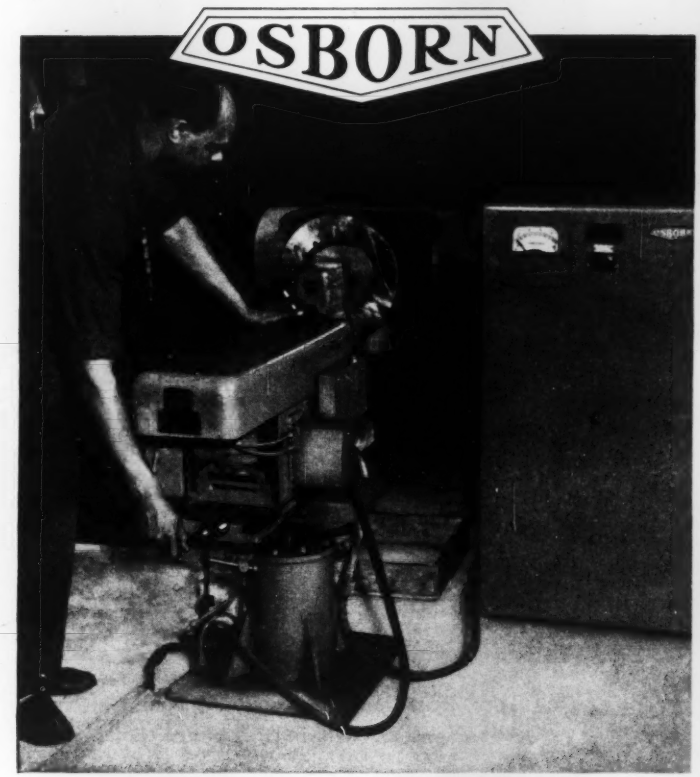
Heald precision speeds the nation's production

INTERNAL AND ROTARY SURFACE GRINDING MACHINES AND BORE-MATICS

THE HEALD MACHINE COMPANY

WORCESTER 6, MASSACHUSETTS

Branch Offices: Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York



Deburrs gears 15 times faster at the push of a button!

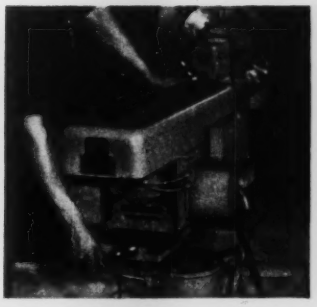
Want to break a big bottleneck in the production of gears and similar parts? Manufacturers are doing just that with the Osborn Work Holder Brushing Lathe.

In the plant of the White Motor Company, Truck Division, Cleveland, Ohio, this Osborn machine deburrs and finishes gear teeth 1570% faster than the old method. This was done formerly with a portable grinder . . . a tedious operation that took 25 minutes for the 14-inch hypoid gears shown. Now, an operator simply places the gear in the Osborn Work Holder Brushing Lathe, pushes a button and the machine does the job automatically. Floor-to-floor time is only 1½ minutes! Uniformity of finish results in additional time savings in matching and assembly of gears.

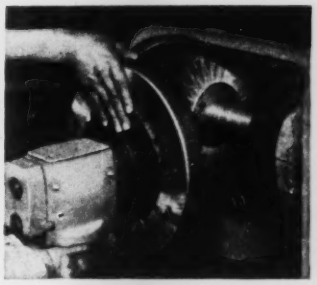
It will pay you to investigate this high-speed, high-quality machine for deburring and finishing gears on a production basis. Call your **O**sborn **B**rushing **A**nalyst today or write *The Osborn Manufacturing Company, Dept. 889, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

Osborn Brushes

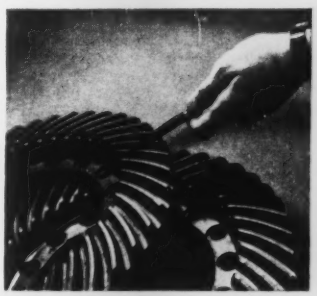
OSBORN POWER, MAINTENANCE AND PAINT BRUSHES AND FOUNDRY MOLDING MACHINES



SET-UP IS SIMPLE. The machine is versatile. If your production involves small runs of many different types and sizes of gears and similar parts, you can specify machine settings for each part and operator can make set-up changes easily and quickly for maximum daily output. The complete brushing cycle is controlled automatically by the electronic timer which is set for any desired brushing interval to suit the size, shape or condition of part being brushed.



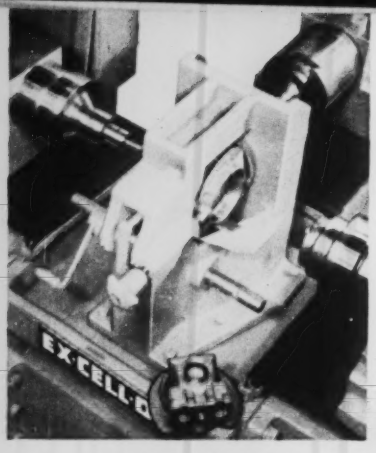
OPERATION IS SPEEDY. The operator mounts the gear easily and quickly. The gear advances to the face of two rotating Osborn brushes and the edge of the gear teeth makes contact with the brushes. To assure fast, positive action on each piece brushed, an automatic control reverses the direction of brush rotation on every cycle of operation.



RESULTS ARE UNIFORM. Burrs and sharp edges are removed uniformly. Every gear tooth has smooth, uniform rounded edges. Surfaces are blended.

INVESTIGATE IT TODAY

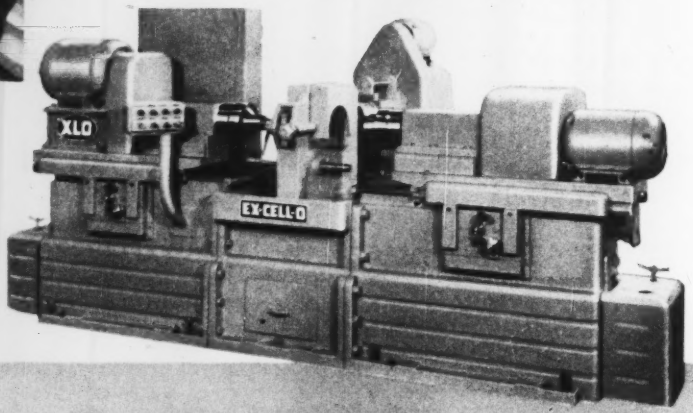
for *your* problems. Users report time savings ranging from 20% to 1570% with the Osborn Work Holder Brushing Lathe. Let us demonstrate what it can do for you!



Close-up view shows relatively simple tooling.

Combine Operations

FOR PRECISION



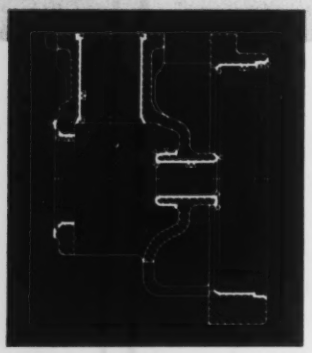
Ex-Cell-O Three-Way Precision Boring Machine.

COMBINING OPERATIONS CUTS COSTS, BOOSTS OUTPUT, PROMOTES ACCURACY

Once a part is properly located and clamped it's good practice to do as much machining on it as possible before it's moved. In this way the various operations can be held in accurate relationship to one another, production is increased, and handling time is minimized.

In machining this cast-iron refrigeration crankcase, five roughing and eighteen finishing operations are held in accurate relationship to one another, with extremely close tolerances on the crankshaft and cylinder bores. Net production for the roughing operation is 33 parts per hour; for finishing, 36 parts per hour.

Ask your local Ex-Cell-O representative about all the other advantages of Ex-Cell-O Way Machines, or write today for Bulletin 31631.



Sectional view with heavy lines to show operations. Single and double triangles indicate, respectively, single operation and rough-and-finish operations.

XLO

EX-CELL-O CORPORATION

DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS
DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

52-15

This Week in Metalworking

STEEL

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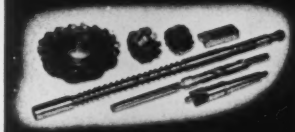
Editorial, Business Staffs—16. Advertising Index—205. Editorial Index available semiannually. STEEL also is indexed by Engineering Index Inc., 29 West 39th St., New York 18.

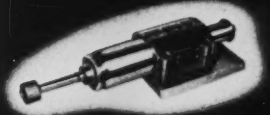
Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $20. Single copies (current issues) 50 cents. Metalworking Yearbook issue $2.00. Entered as second class matter at the postoffice in Cleveland, under the Act of March 3, 1879. Copyright 1952 by Penton Publishing Co.

XLO
EX-CELL-O PRECISION

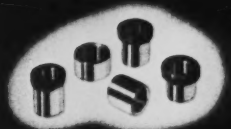
PRECISION MACHINE TOOLS



CONTINENTAL CUTTING TOOLS

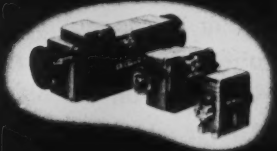


PRECISION GRINDING SPINDLES



DRILL JIG BUSHINGS

AIRCRAFT AND PRECISION PARTS

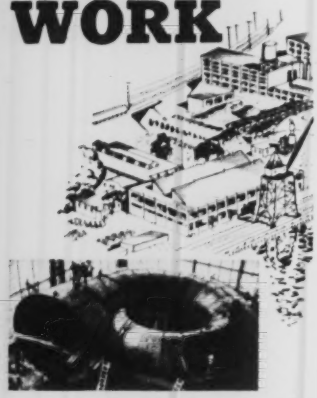


HYDRAULIC POWER UNITS

Products of

EX-CELL-O
CORPORATION
DETROIT 32, MICHIGAN

STEEL PLATE WORK



TURBINE CASINGS and other heavy steel plate work are fabricated at Pusey Jones of Hot Rolled, High Strength, Low Alloy Steel.

Every facility for large scale metal fabricating: — Heavy plate shop equipment — Rolls — Shears — Bending furnaces. Stress relieving furnace 33'x18'x16' up to 2100 F. Machine shop for facing, turning, and boring. 50 ton capacity gray iron foundry. Deep-water transportation on one side, the Pennsylvania RR on the other. Talk to our development engineers.

Metals Fabrication Division
THE PUSEY AND JONES CORP.
506 Front St., Wilmington, Del.
Established 1848

PUSEYJONES

Behind the Scenes...

Set the Guard

You'd better take good care of your machines and treat them right. We just heard that someone estimates that by 1960, human muscle will be doing only about 3 per cent of our work. Animals will only do 1 per cent while machine power will be doing 96 per cent.

We're not much worried about it but we think the animals should be told they're getting cut out.

Sweat and Cheers

When we first saw the plans for the big Yearbook issue we will deliver to you on January 5, the article caught our eye on what metalworking management expects next year and the years ahead.

The article will be based not on any one man's ideas or opinions—it'll be a report of a real cross-section of you folks in industry. More than 5000 questionnaires were sent out to see what you're thinking as a whole.

The questionnaires now are back and have been sorted and coded by the research department. Sorting and coding took two girls 3 days. Then the information on the returns was punched on IBM cards. That took two girls two more days and required punching some 43,000 holes. These punch holes, incidentally, if laid end to end would stretch out longer than three football fields.

Next the cards were run through IBM machines for the answers to the questions asked by the editors. That took one man four days. Then the answers were cross-checked to make sure they were right.

Now the work has been done and the whole shebang is in the hands of the editors for analysis and interpretation. The article will be presented in a special 16-page section and you'll want to read it. It will tell what you think is going to happen under Eisenhower, not what some guy with a crystal ball dreams up!

Speaking of what's likely to happen, just West of here on the front cover and to the East of us on the inside are told the story about what the future holds for the construction industry. Next week you'll get a close look at the household appliance industry and the following week we'll tell you more about Europe's industrial picture and what it means.

Ghostly Vengeance?

There may be poetic justice in some recent stymied efforts to establish a new steel mill in New England. They're now restoring the first iron works at Saugus, Mass. Some research in connection with the restoration indicates the English had a 37-year headache in operating the works, 1646-83, mostly caused by management troubles which they attempted to cure by litigation.

One manager was charged with selling wrought iron for his own account and overseas owners, with £1000 invested, had no dividends forthcoming. They were continually in Colonial courts. Finally nearby settlers, bothered by high water, man-made ponds and excavations for bog iron ended it all by blowing up the waterwheel and dam.

Puzzle Corner

The answer to the puzzle in the issue of Dec. 1 is that Sam is going to dig that hole 8 feet 6 inches deep. At the time we talked to him, Sam had gone 4 feet 3 inches of the way. First to figure Sam's plans were: Robert B. Pumphrey, Gulf Coast Machine & Supply Co., Victor Morgan, Ambridge, Pa., Orville F. Jones, J. I. Case Co., Geo. A. Meyer Jr., Malleable Founders' Society and L. D. Rice, Timken Roller Bearing Co.

Here's the one for this week. On his trip to Reno, Al spent the last night in three different clubs. At the first he doubled his money and spent $30. At the second he tripled his money and spent $54 and at the third he quadrupled his money and spent $72. Al then had $48 left to get home. How much did he start with?

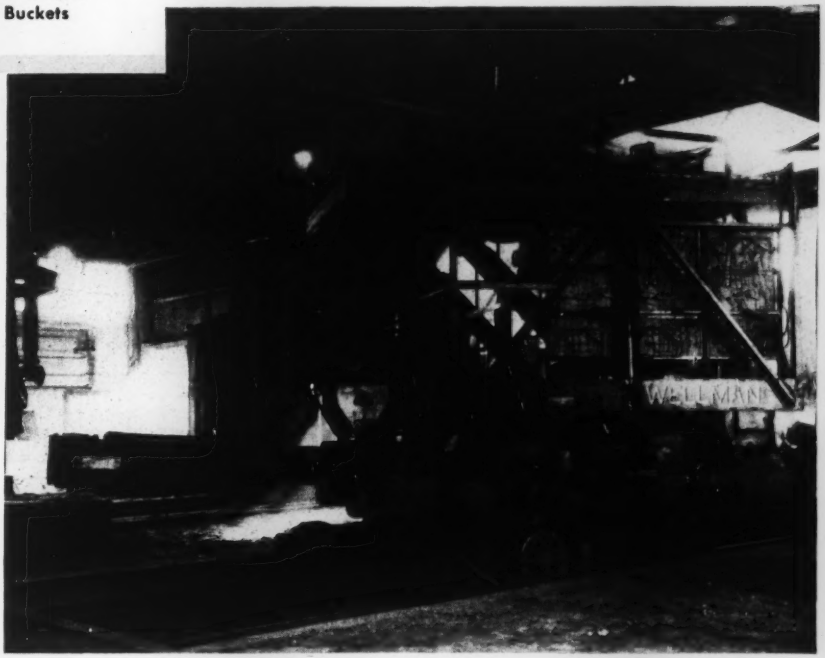
Shrdlu

(Metalworking Outlook—Page 67)

Wellman will build it

Special Cranes
Forging Manipulators
Charging Machines
Ore Unloaders
Car Dumpers
Gas Flue Systems
Gas Reversing Valves
Coke Pushers
Mine Hoists
Skip Hoists
Ore and Coal Bridges
Clamshell Buckets

→ **Wellman forging manipulators** handle big ingots speedily, efficiently



Wellman Forging Manipulator with white-hot ingot ready for forging.

● Wellman Forging Manipulators hold hot steel ingots on anvil dies, turn them and keep them level for efficient forging . . . despite hammering shocks. You can count on *all* Wellman equipment for speedy, economical service. It is backed by more than a half century of leadership in designing manufacturing and construction of heavy materials handling facilities.

THE WELLMAN ENGINEERING COMPANY

7000 CENTRAL AVENUE • CLEVELAND 4, OHIO

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REYNOLDS

MODERN DESIGN HAS

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  (from mine to finished products)
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- Finishes for Aluminum
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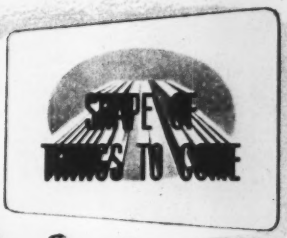
- Metals Weight Slide Rule
- Welding Aluminum

Handbooks are free when requested on business letterhead otherwise the price of each book is one dollar.



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- **SHAPE OF THINGS TO COME.** Interesting description of the aluminum extrusion process and the design opportunities it provides. Running time 30 minutes.
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Order from REYNOLDS METALS COMPANY, 2520 South Third Street, Louisville 1, Kentucky

ALUMINUM

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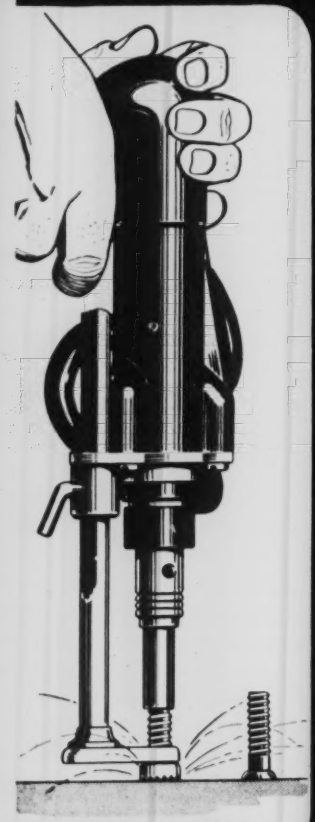
IN STEEL FABRICATION...

HERE'S HOW NELWELD SPEEDS PRODUCTION



AN ELECTRIC ARC WELDING PROCESS

END-WELDS STUDS TO STEEL IN A SPLIT-SECOND

ELIMINATES DRILLING, TAPPING, HAND WELDING

REDUCES MATERIAL HANDLING—TAKES THE TOOL TO THE WORK

NELWELD

SAVES STEEL—ELIMINATES HEAVY BOSSES AND FLANGES

IMPROVES PRODUCT DESIGN AND QUALITY

A NELWELD CLINIC CAN SHOW YOU—

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Write today for the Nelweld Clinic brochure to Lorain, Ohio.

Fasten it Better...at Less Cost with NELWELD

NELSON STUD WELDING

DIVISION OF GREGORY INDUSTRIES, INC., LORAIN, OHIO

LETTERS
TO THE EDITORS

Reading List for Managers

Over the years we have in our department gathered considerable material from your magazine, STEEL, primarily with the intent of keeping our people informed of the latest and most approved manufacturing methods.

We have recently made up an index of these articles and sent the index to our manufacturing managers throughout the General Electric Co.

Many of these articles are now out of print for tear sheets or reprints . . .

We would like your permission to reproduce some of these articles. We would probably not require more than two or three copies of any one article, and they will be used entirely for internal distribution.

We would appreciate receiving your permission as soon as possible so we can start making our own copies and distributing this useful manufacturing information.

Harry Gorden
Manufacturing Services Division
General Electric Co.
Schenectady, N. Y.

• *Permission granted.—ED.*

Stands Pat with STEEL

I found STEEL very interesting and useful and I would recommend it to anyone connected with industry. Having been brought up as an electrical engineer, I never took the occasion to follow STEEL regularly until recently and I want to continue reading it.

P. S. Stevens
vice president-engineering
Bucyrus-Erie Co.
South Milwaukee, Wis.

Move for Small Business

Your Nov. 17 issue of "Small Business in Action" is of particular interest to us and we would appreciate your forwarding 6 copies.

Arthur B. Davies
executive director
Smaller Manufacturers Council
Pittsburgh

• *They're sent.—ED.*

Versatile Suction Cups

Not too long past you ran an article on the lifting of heavy plates with vacuum cups in one of the big mills. The cups were used to grip and transport the plate from one place to another.

We currently have an order from

Continued on following page

LONG LIFE!

1

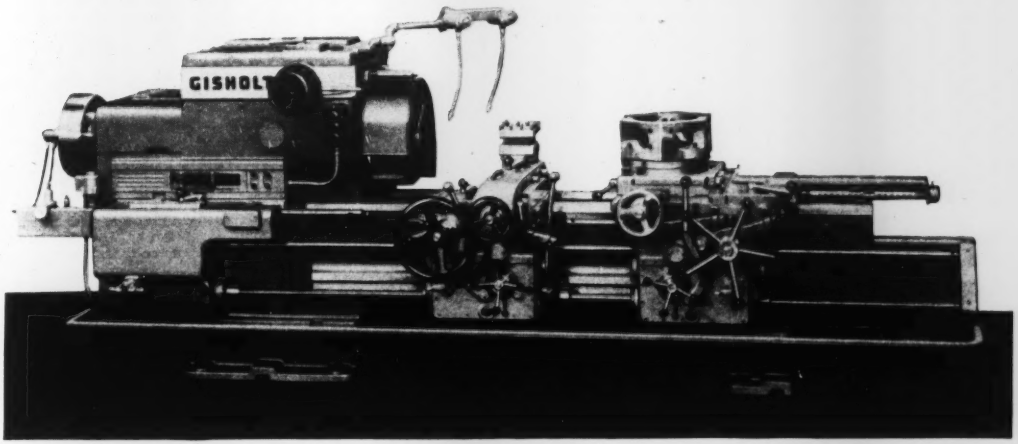
All gears in Gisholt turret lathe transmissions are high carbon alloy steel, precision ground after heat-treatment to assure long wearing quality. All shafts turn on antifriction bearings, with pressure spray lubrication. Headstock is cast integral with bed for extreme rigidity—to maintain accurate, permanent alignment.

2

Gisholt's thick, block-type ways are automatically pressure lubricated. Made of SAE 52100 tool steel, they are deep hardened to 64-66 Rockwell C and then finish-ground for exact alignment with the spindle. On top, bottom and both sides, they present a bearing surface that is virtually wear-proof—accurate for years to come.

3

Aprons are fully enclosed, all working parts protected and operating in a continuous cascade oil bath. Alloy steel gears and shafts are mounted on antifriction bearings. Positive serrated feed and traverse clutches cannot slip or drag. Safety shear pins protect feed and traverse mechanism against overload and accident.



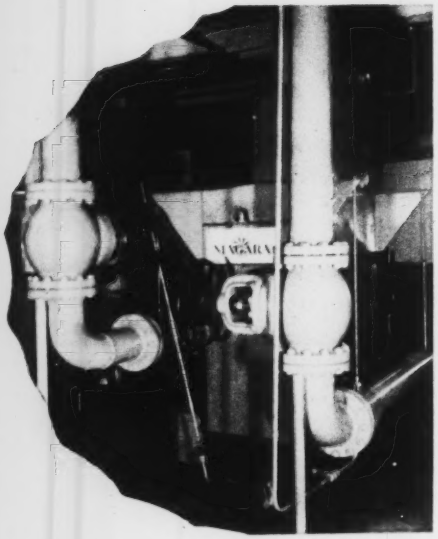
You'll find all the speed and easy operation you want in these new Gisholts. But you want long life, too. Here's the lasting accuracy, freedom from repair bills and proved performance that protect your turret lathe investment for years to come.

GISHOLT MACHINE COMPANY
Madison 10, Wisconsin

THE GISHOLT ROUND TABLE
represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

TURRET LATHES · AUTOMATIC LATHES · SUPERFINISHERS · BALANCERS · SPECIAL MACHINES

How to get drier or cooler air or gases . . .



NIAGARA AERO AFTER COOLER cools a compressed gas, or air, below the temperature of the surrounding atmosphere, thus preventing the condensation of moisture in your lines. The gas will contain only half of the moisture left in it by conventional methods. Even drier gas can be produced if you require it.

In working with controlled atmospheres of inert gases to prevent undesired reactions, this dryness of the gas at low cost is a great advantage. The cost of the Niagara method is low because it uses evaporative cooling, saving 95% of the cost of cooling water (and its piping and pumping). This direct saving of cost pays for the Niagara cooler in less than two years.

If you use compressed air to operate tools or pneumatic equipment you save much in water and oil damage to tools and equipment, and in water damage to materials by using the Niagara Aero After Cooler.

Write for a bulletin, or ask nearest Niagara Field Engineer if you have a problem involving the industrial use of air.

NIAGARA BLOWER COMPANY

Over 35 Years' Service in Industrial Air Engineering

Dept. S, 405 Lexington Ave. New York 17, N. Y.

Experienced Field Engineers in Principal Cities of U. S. and Canada

LETTERS

Concluded from preceding page

North American Aviation Inc. to design a similar unit to handle milled airplane skins.

If you have a reprint available on this article, please send it to us. If not, please give us the name of the author and the mill mentioned and we will write them direct.

J. A. Ferrara
J. A. Ferrara Engineering Co.
Glendale, Calif.

• *Reprints of the article, "Continuous Casting Teamed with Cold Rolling" (Dec. 19, 1949, p. 74), are being sent. —ED.*

Seeker of Pure Metals

Will you please tell us where we may secure a small amount of pure tin, zinc and lead. This is for use in calibrating thermocouples.

J. C. Hardgrave
professor mechanical engineering
Texas Technological College
Lubbock, Tex.

• *Chemical supply houses stock small quantities of pure metals. If the degree of purity is sufficient, that's a good source. The National Bureau of Standards, Washington, has a limited supply of some high purity metals. The following organizations may be able to help you further: Lead Industries Association, New York; Tin Research Institute, c/o Battelle Memorial Institute, Columbus, O.*

Selective Reading

We would like to receive your pamphlet "Guide for Selecting Tool Steels and Carbides". We believe that this phamphlet will be of value in this factory. Please advise whether it is possible for us to obtain a copy.

J. Finkel
Independent Lock Co.
Fitchburg, Mass.

• *They're sent.—ED.*

Fast Tooling Gets Attention

We are interested in obtaining reprints of the article "Big Tooling Job Completed in Record Time" (Oct. 6, p. 80). Provided such reprints can be supplied, please advise us of quantity of order required.

B. J. H. Norris
Norris Engineering Co.
Dallas

• *The type is still standing and 100 copies is the minimum order.—ED.*

Grinding by Electrolytic Action

I would appreciate receiving a reprint of your article "Electrolytic Grinding—Stubborn Alloys Less Formidable" (Mar. 17, p. 84).

Charles Nolin
Electromechanical Ordnance Division
National Bureau of Standards
Washington

• *They're sent.—ED.*

SPHEROIDIZED
Annealed, soft and ductile—ideal for cold forming operations.

PEARLITIC
Temper-rolled in controlled hardness and strength for blanking.

made right—
to make good
on the job

WEIRTON HIGH-CARBON STRIP COLD-ROLLED SPRING STEEL

There is a Weirton cold-rolled spring steel that is just right for forming . . . and another exactly right for blanking. Whichever you use, you will find that it makes the operation easier, and meets the requirements for many products in which high fatigue resistance is essential.

Weirton High-Carbon Strip possesses, to an unusual degree, these highly desirable properties and qualities: Accurate response to heat treatment. • Uniformity of gauge and width. • Uniform chemical and physical properties. • Exact constancy of grain structure. • Controlled decarburization limits.

Weirton High-Carbon Strip is obtainable with the desired chemical analysis and for specific heat treating and hardness ranges, in widths up to seven inches.

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

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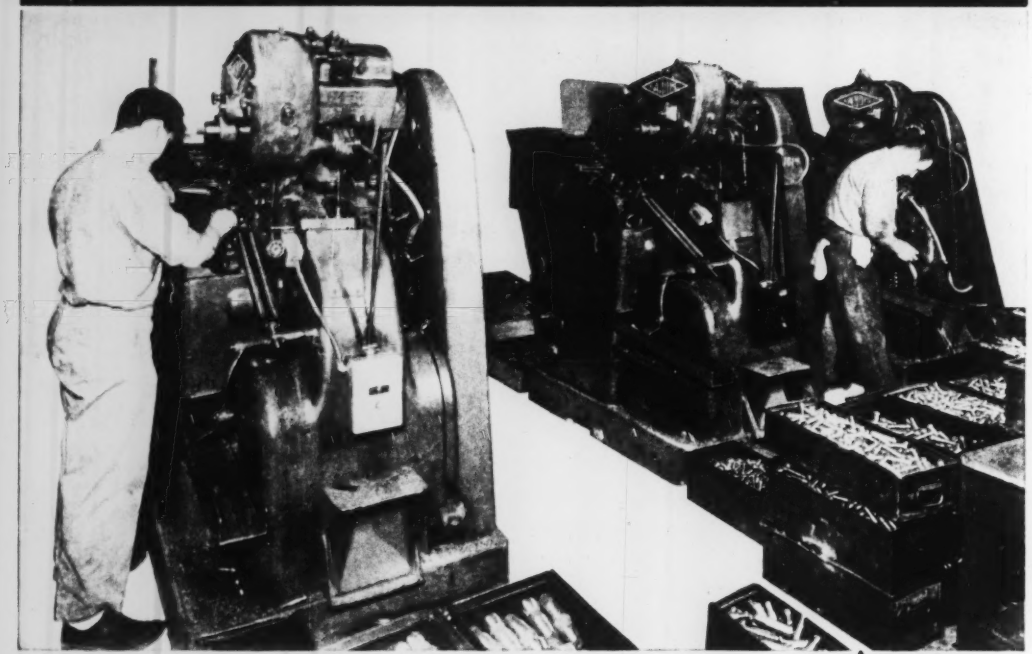
LANDIS "Automatic" PROVED BY PRODUCTION . . . .



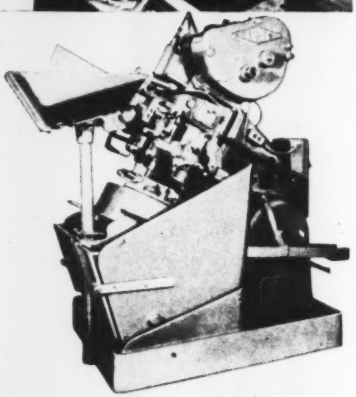
Points and Threads 1020 Ball Studs per hour

Through the use of LANDIS Automatic Forming and Threading Machines, a large manufacturer has solved his problem of mass-producing certain automotive parts.

The workpieces are cold-forged blanks, from which ball studs are made. Specifications require a 45° point and a 9/16"-18-pitch N.F. thread cut to a length of 5/8". In constant daily operation is a battery of LANDIS Automatic Forming and Threading Machines, each of which point and thread 1020 pieces per hour. Four hours of production are obtained between each chaser grinding, resulting in low tool cost and minimum machine down-time.

Because of their universal features, LANDIS Automatic Forming and Threading Machines are adaptable to mass-production operations on a wide range of automotive parts. By means of pick-off speed change gears, the machine cycle can be varied to accommodate any combination of thread length, pitch, and thread diameter, within the capacity of the machine—therefore this machine is adaptable to a wide variety of work. Hopper feed and automatic operation throughout enable one operator to keep a battery of machines in constant production, while set-up changes of all types can be made in minimum time.

Can you revolutionize your pointing and threading operations with LANDIS Automatic Forming and Threading Machines? Please give specifications when writing for complete information.



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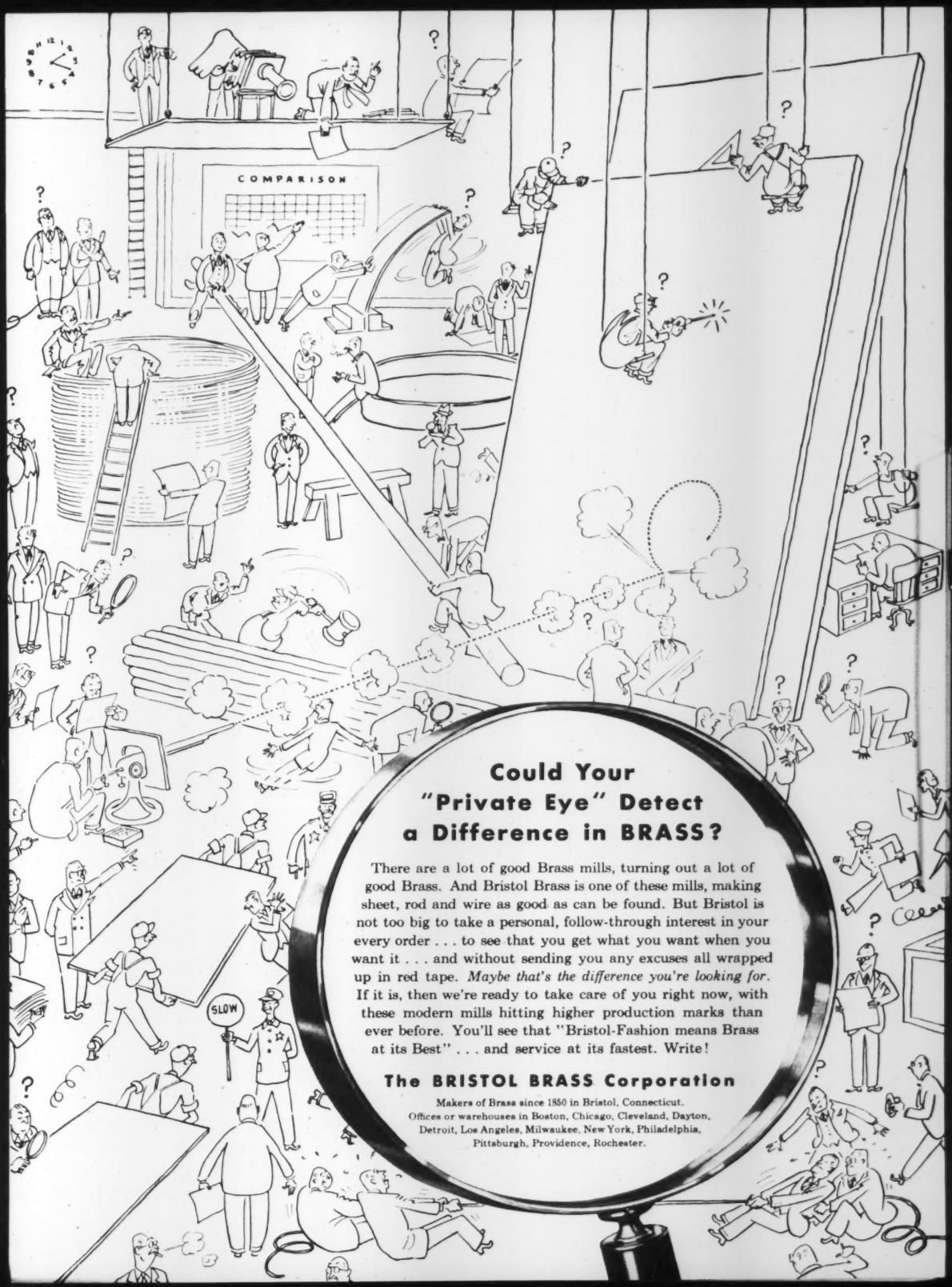

Could Your "Private Eye" Detect a Difference in BRASS?

There are a lot of good Brass mills, turning out a lot of good Brass. And Bristol Brass is one of these mills, making sheet, rod and wire as good as can be found. But Bristol is not too big to take a personal, follow-through interest in your every order . . . to see that you get what you want when you want it . . . and without sending you any excuses all wrapped up in red tape. *Maybe that's the difference you're looking for.* If it is, then we're ready to take care of you right now, with these modern mills hitting higher production marks than ever before. You'll see that "Bristol-Fashion means Brass at its Best" . . . and service at its fastest. Write!

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Makers of Brass since 1850 in Bristol, Connecticut.
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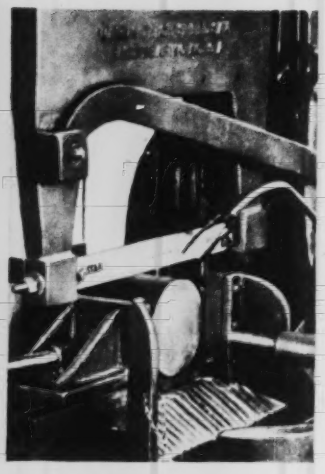

best metal cutter...
real cost cutter...

STAR "Moly"®

High Speed POWER Hacksaw Blades

To cut your initial power hacksaw blade costs at least 15%, tell your Distributor you want STAR "Moly" High Speed Power Blades.

STAR "Moly" Blades give you an extra dividend, too—cutting that's been proved faster and more efficient.

Over the years, *quality* above all has made STAR Blades industry's *preferred* blade—top quality steel, carefully heat treated, manufactured on specially designed equipment, to give you fast, economical cutting and long blade life.

FAST, LOCAL SERVICE from your STAR Distributor's Stock

STAR "Moly" Blades are sold only through recognized Distributors—the men you know and have confidence in, the men who have inventories on hand to give you fast delivery where and when you want it. It is wise to buy whatever you can from your recognized Distributor.

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MIDDLETOWN, N. Y., U. S. A.
Makers of Hand and Power Hack Saw Blades, Frames, Metal Cutting Band Saw Blades and Clemson Lawn Machines.

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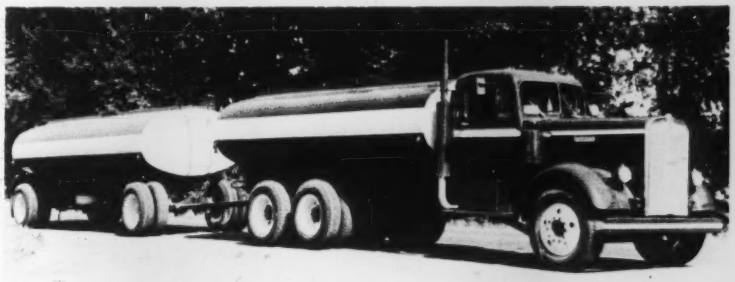
Member of Controlled Circulation Audit, Inc., Magazine Publishers Association Inc., Society of Business Magazine Editors, and National Business Publications, Inc.

New facts for your file on U·S·S HIGH STRENGTH STEELS

Here U·S·S COR-TEN steel reduces weight 1500 lbs. saves $725 per year in hauling costs.



By using U·S·S Cor-Ten high strength steel in lighter gages, in place of carbon steel, the Beall Pipe and Tank Corporation, Portland, Oregon, has reduced tank weight in this 8100 gal. unit by three-quarters of a ton.

THE 242 gallons of gasoline that ride in place of the 1500 lbs. of steel saved, are hauled at no extra cost. Each of these free-riding gallons provides about $3.00 per year *extra* revenue—a saving in delivery costs that totals $725 annually.

In addition, the lighter weight of this equipment pays off for the operator in lower license fees, in reduced fuel consumption, in less wear on brakes and tires, less wear on the vehicle itself. And because U·S·S Cor-Ten steel has 4 to 6 times greater resistance to atmospheric corrosion than plain steel, and is more resistant to load surge and road vibration, this equipment will stand up better and cost less for maintenance and repairs.

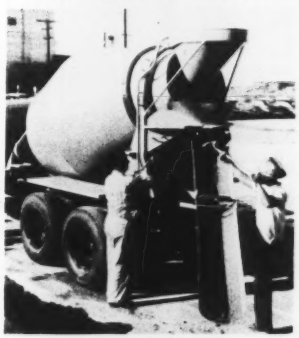
These savings are typical of lightweight construction with Cor-Ten steel and they are practically all clear profit. That is because U·S·S Cor-Ten steel construction saves weight at lowest cost—sometimes costs no more than heavy carbon steel construction.

By using U·S·S Cor-Ten steel to reduce weight, the equipment builder also benefits. For by saving *weight*, he *saves steel* which makes his steel supply go further. That's important anytime—but especially important now.

Builder of concrete mixers has good reasons for using U·S·S COR-TEN steel construction

"We prefer U·S·S Cor-Ten steel," says Mr. Ross Castendyck of the Challenge-Manufacturing Co., Maywood, Cal., "because of its superior corrosion and abrasion resistance as well as its high strength. These permit us to reduce our Mixer weight 10% to 15%, and at the same time make it possible to build a 20% stronger unit that will stay in service at a lower maintenance cost."

We will be glad to show you how this superior high strength steel can be most economically applied to make your equipment more durable and more efficient.



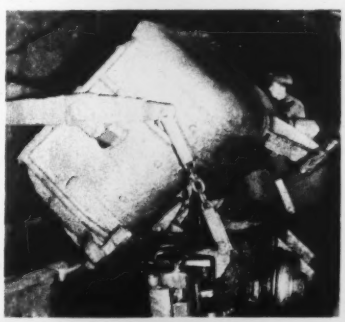
WHAT IS U·S·S COR-TEN HIGH STRENGTH STEEL?

U·S·S Cor-Ten is a ductile, low-carbon chromium-nickel-silicon-copper-phosphorous steel having a yield point of 50,000 psi min., and a tensile strength of 70,000 psi min. in thicknesses ½" and under.

Its resistance to abrasion and shock is superior to structural carbon steel; its fatigue resistance that is, its ability to withstand repeated stresses is 60% greater.

What particularly distinguishes U·S·S Cor-Ten steel is its unusually high resistance to atmospheric corrosion—4 to 6 times that of plain steel, 2 to 3 times that of copper steel. This property helps to assure the long life and low maintenance cost of any equipment, subject to rusting, in which Cor-Ten steel is used, whether to obtain greater durability or to reduce weight.

U·S·S Cor-Ten steel is produced in all standard products—plates, shapes, bars, sheets, strip, special cold-formed sections and wire. Recommended particularly for application in light and intermediate thicknesses.



29,725 mine cars have been built with U·S·S COR-TEN steel

Why? Simply because U·S·S Cor-Ten steel gives equipment the stamina to stay on the job. Witness this mine car, one of 22 built by C. S. Card Iron Works Company and put into service in 1941 in a western copper mine.

Though designed to be used with a 12" grizzly, the cars were loaded from a 24" grizzly handling chunks of very abrasive ore twice as large as they were designed for. Despite this and after operating eleven years under highly corrosive conditions, the cars are still on the job and ready for more service although each car has handled more than 85,000 tons of ore.

With tougher, stronger Cor-Ten steel not only mine cars, but buckets, skips and cages, shovels, trucks, scrapers, dozers, carryalls, etc. can be built to last longer and do more work.

UNITED STATES STEEL COMPANY, PITTSBURGH · AMERICAN STEEL & WIRE DIVISION, CLEVELAND · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
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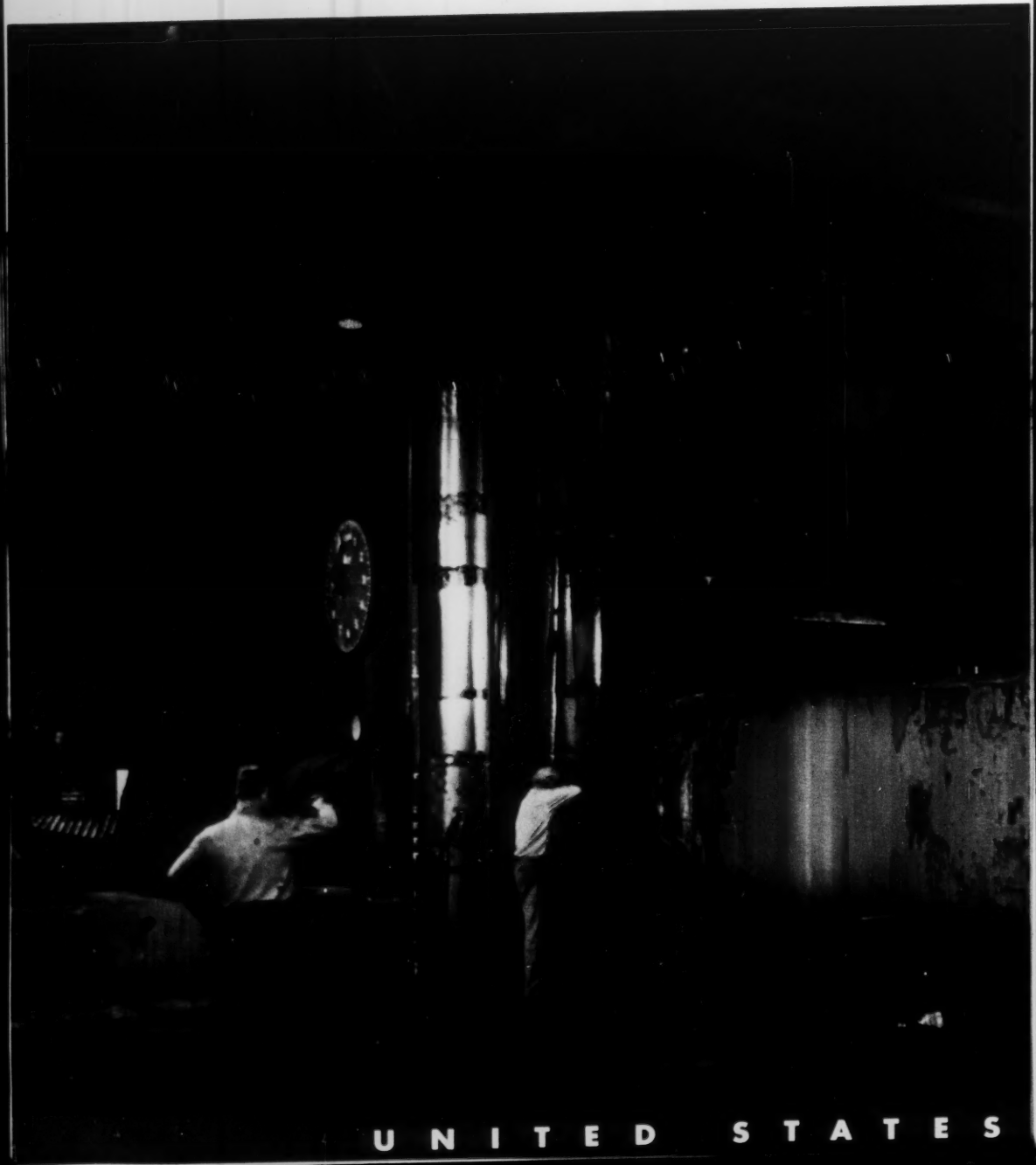
USS

UNITED STATES STEEL

"My crew is as good as



you can find"

says Alex Janathan,

U. S. STEEL PRESSMAN

● If you were to visit the forge shop at our Homestead District Works, you'd want to see the 7,000-ton press at work. This isn't our biggest press, or our smallest, but it handles some of our most interesting jobs.

The entire crew—press driver, manipulator operator, craneman and helpers are under the direction of Alex Janathan who started in the open hearth when he was 16. If you talked to Alex, here's about the way the conversation might go:

YOU: *"What did you do after you left the open hearth?"*

JANATHAN: "When I left the open hearth, after 3 years, I was first man on the ladle. Then I went to the Heat Treating and Forge Department and worked on the alloy plate shears for 3 years."

YOU: *"And you've stayed in the forge department ever since?"*

JANATHAN: "Yes, at different jobs. After working the shears, I went burning for 3 years—cutting locomotive side frames out of slabs. It was a new idea to replace castings. While I was burning, I got turns as helper on the 3,000-ton press. I worked as press driver, then in '34 was made pressman."

YOU: *"So you've been a pressman now for about 18 years. Did you work on other presses, too?"*

JANATHAN: "I've worked every press we own."

YOU: *"Do you specialize on any one type of product?"*

JANATHAN: "No. I make turbine and generator shafts, every kind of alloy and stainless steel forgings. I also make water wheel shafts, U-plates, half-circles, as well as drop hammer bases and columns."

YOU: *"What's one of your biggest problems while you're forging these big jobs? What do you have to watch for?"*

JANATHAN: "Well, there's the problem of ingots that don't cool evenly while they're on the press."

YOU: *"What causes that?"*

JANATHAN: "When the ingot comes from the furnace, it's evenly heated all the way through, but it's covered with scale. While we work it, sometimes the scale gets knocked off on just one side; so that side cools faster than the side that's insulated with scale. When we forge a piece like that, the hot, or scale side flows outward faster than the cool side, and the piece will not forge accurately."

YOU: *"What do you do then?"*

JANATHAN: "First, we try to remove scale evenly from the ingot. But if it still cools unevenly, we spray the hot side with water until the temperature is even all around. Then the ingot flows the same on all sides. Even ingot heat is awfully important. . . . If it cools too much, the corners start to tear, especially when you're forging alloy and stainless steels. These things are important because we work to such close tolerances. Take a 55" ingot. When we forge a die block bloom from that ingot we reduce it to 37" x 21" and only have 1/4" tolerance."

YOU: *"As far as you're concerned, what's the most important factor in making good forgings?"*

JANATHAN: "First, you have to have good steel. We make our own so that's never a problem. Then you have to have good equipment. We've got the best. But most important is the crew. Mine for example. Turnover is small. Every man knows his job and has been on it for years. I've visited a lot of forge shops, but my crew is as good as you can find."

• • •

When you buy forgings from United States Steel Company, men like Alex Janathan and his crew work on them. We'll match their skill against the best in the land. For more information on U·S·S Quality Forgings, write to United States Steel Company, 525 William Penn Place, Pittsburgh 30, Pa.

USS

Quality

S T E E L

New facts for your file on U·S·S STAINLESS

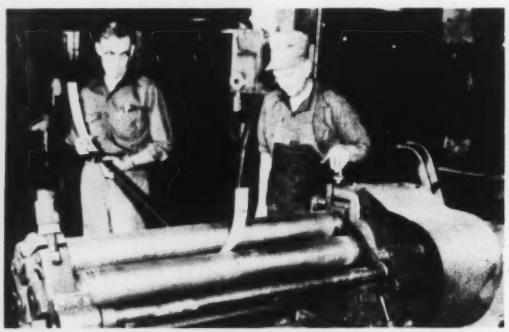
Purity Manufacturing Company makes successful switch to straight-chromium U·S·S 17 *(Type 430)* Stainless Steel

● For many years, Purity Manufacturing Company, Cattaraugus, N. Y., had specialized in fabrication of equipment from nickel-chromium grades of Stainless Steel. Because of restrictions on these grades, their attention was turned to straight-chromium Stainless Steels for many of their applications.

The firm, for more than a year now, has concentrated its production on items fabricated from U·S·S 17 Type 430 Stainless Steel, and no special problems have been presented.

Light-gage sheets and bars are used, and the operations involve shearing, punching, roll and brake forming, arc and spot welding and grinding. Kitchen equipment for government hospitals is one of the jobs fabricated from Type 430 Stainless Steel at Purity Manufacturing Company.

Table top, drawers and racks of this hospital kitchen table are U·S·S 17 (Type 430) Stainless Steel. Table top is 10 gage, drawers are 16 x 20 gage, racks are [illegible] x 2"



Roll forming a portion of the rack for a hospital kitchen table at Purity Manufacturing Company, Cattaraugus, N. Y. Material used is [illegible]" x 2" flats of U·S·S 17 (Type 430) Stainless Steel

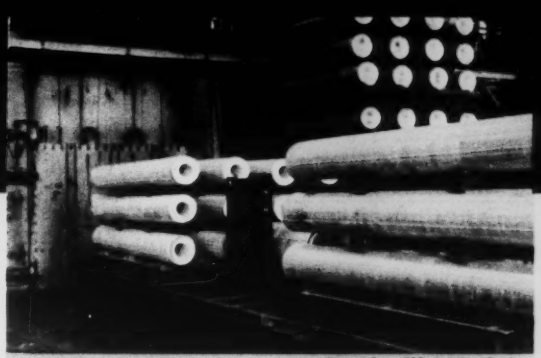
Type 403 Stainless Steel meets requirements for compressor blades of General Electric aircraft jet engines

U·S·S STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

STEEL

USS STAINLESS STEEL — UNITED STATES STEEL



Load of aluminum hollows on ingot trays and dollies of Type 502 Stainless Steel ready to enter the heating furnace at Alcoa's Lafayette Works.

Straight-chromium grade of Stainless Steel solves oxidation problem at Alcoa's Lafayette Works

● Aluminum Company of America had sought a metal that would stand up under conditions encountered in their heating furnaces for homogenizing aluminum alloy ingots. Carbon steel parts and equipment had been used with relative success at temperatures for which their furnaces were originally designed. When it became necessary to substantially raise the operating temperature level, it was found that carbon steel became severely warped and oxidized in a prohibitively short time.

Interior view of the heating furnace showing the Stainless Steel lining and ceiling.

Chief operations at the Lafayette Works are remelting and casting of ingots and production of extrusions and tubing. Furnace loads range between 35,000 and 40,000 pounds, and some of the heating cycles are 18 hours, with an eight-hour period where temperatures may range as high as 1150° to 1175° F.

Three years ago, for this type of operation, they turned to U·S·S 5S (Type 502) Stainless Steel—a straight-chromium grade containing small additions of molybdenum and titanium. It is used for furnace linings and supports; baffles, ingot trays, ingot spacers, load trays and dollies.

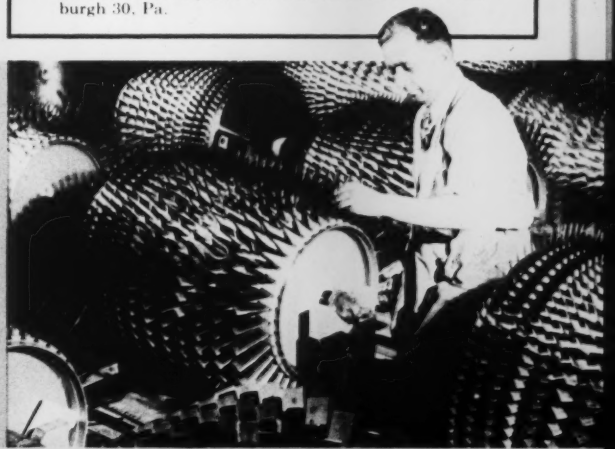
For three years now U·S·S 5S has stood up satisfactorily without failures and with a minimum of warpage and scaling. Staff Engineers are highly satisfied with the results.

Helpful facts on fabrication

Complete fabrication information on these and all the other grades of U·S·S Stainless Steel will be found in our booklet "Fabrication of U·S·S Stainless and Heat Resisting Steels." For your copy, write to United States Steel Company, 525 William Penn Place, Pittsburgh 30, Pa.

● Based on its performance in steam turbine buckets, General Electric Company has selected Type 403 Stainless Steel—another straight-chromium grade—for the compressor blades in its J47 jet engines.

The blades are forged from ⅛ in. round bar stock. Type 403 was selected for this application for several reasons, including its ability to develop high strength and its corrosion resistance properties.



Type 403 Stainless Steel is used for the compressor blades of G-E J47 jet engines.

UNITED STATES STEEL COMPANY, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

New facts for your file on U·S·S CARILLOY STEELS

U·S·S Metallurgical Assistance saves rotary pump manufacturer $40 a ton on steel for gears

Commercial Shearing & Stamping Co., of Youngstown, Ohio, needed a good alternate steel for their rotary pump gears to replace an alloy steel that was in short supply. They called in a U·S·S Service Metallurgist for advice. After analyzing the requirements, he recommended a *less expensive* alloy steel—CARILLOY 5120.

These rotary hydraulic pumps develop pressures as high as 1500 psi and operate at speeds up to 2,000 rpm. Gear wear must be limited to less than .005 inch to maintain high pump efficiency.

Such severe service demands a very tough, wear resistant steel. It was found in CARILLOY 5120. This steel meets every performance requirement of these precision gears, and cuts costs besides.

It cuts tool costs because it is easier to machine, and tools last longer. In addition, it requires less heat treating. Normalizing and straightening are no longer necessary, because there is much less distortion. This reduced heat treating cost combined with a lower grade extra cuts the cost of gear steel $40 a ton—a saving of about 25%.

U·S·S Carilloy steel provides exceptionally tough, wear resistant gears at reduced cost in Commercial Shearing & Stamping Co.'s rotary hydraulic pumps. Machining is easier than before, and less heat treating is required.

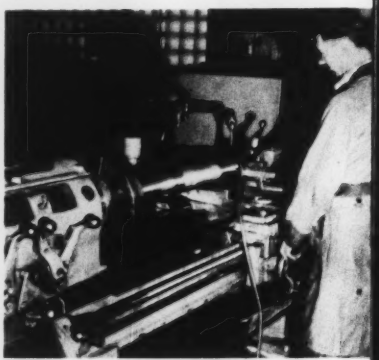
Tools last 3 times longer, production increased 14%, with U·S·S Carilloy FC steel

By changing from heat treated carbon steel to a U·S·S CARILLOY FC steel recommended by U·S·S metallurgists, Trackson Co., of Milwaukee, Wisconsin, reduced costs and speeded up production of shafts for their "PIPE LAYER."

These precision shafts must be machined to very close tolerances, and they must be strong and durable. Trackson Co. had been using 4¼" round bars heat treated to 269-321 Brinell. But this steel was extremely difficult to machine. Tools had to be reground and replaced frequently, and production was slow.

Trackson engineers consulted U·S·S metallurgists to find out if they could get the necessary strength and hardness from some other steel that would be easier to machine. Free-cutting, pre-hardened CARILLOY FC steel solved the problem.

This special alloy steel comes from the mill already quenched and tempered to any hardness from 255 to 375 Brinell; and it is easy to machine. As a result, tools last much longer, parts can be made faster, and the need for additional heat treating after machining is eliminated.



Drum shafts for Trackson Co.'s "PIPE LAYER" are made faster with U·S·S Carilloy FC steel than with heat treated carbon steel. Tools last much longer because Carilloy FC is easier to machine, and no heat treating is required after machining.

At Trackson Co., tools now last 3 times longer than before the switch to CARILLOY FC, and production has increased 14.3%! Trackson Co. gains these important advantages with a steel that costs only slightly more than a through hardening steel.

U·S·S metallurgists will help you with any steel problem

These case histories show how U·S·S metallurgists helped two manufacturers reduce costs and improve their manufacturing operations. In one application, they recommended a good alternate steel to use in place of an alloy steel that was in short supply; in the other, they solved a difficult machining problem.

Our metallurgists will be glad to help with any problem involving the more efficient use of steel. With wide experience and intimate knowledge of the very latest advancements in steel, they may be able to suggest a steel that is better suited to your job than the one you are now using, or perhaps they can show you how to improve your fabricating or heat-treating methods. You can contact them through the nearest U·S·S District Sales Office or by writing to United States Steel Co., 525 William Penn Place, Pittsburgh 30, Pa.

USS

UNITED STATES STEEL COMPANY, PITTSBURGH — COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. — UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS, COAST TO COAST
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

How would you like to see your costs going down?

(FOR A CHANGE)

● With spiraling costs the headaches they are today, it's especially encouraging to see examples of costs going down. And that's exactly what happened at Walter Kidde & Company, Inc. of Belleville, N. J. This manufacturer put the skids under constantly rising costs by installing six new Warner & Swasey 1-AC Single Spindle Automatic Chucking Machines.

These new machines now handle turning and chucking operations on nine different parts—all formerly done with hand-operated machines—at less than ⅓ of the previous cost.

But that's not all! The 1-AC's helped solve a pressing manpower problem, because one operator can now handle two or more machines.

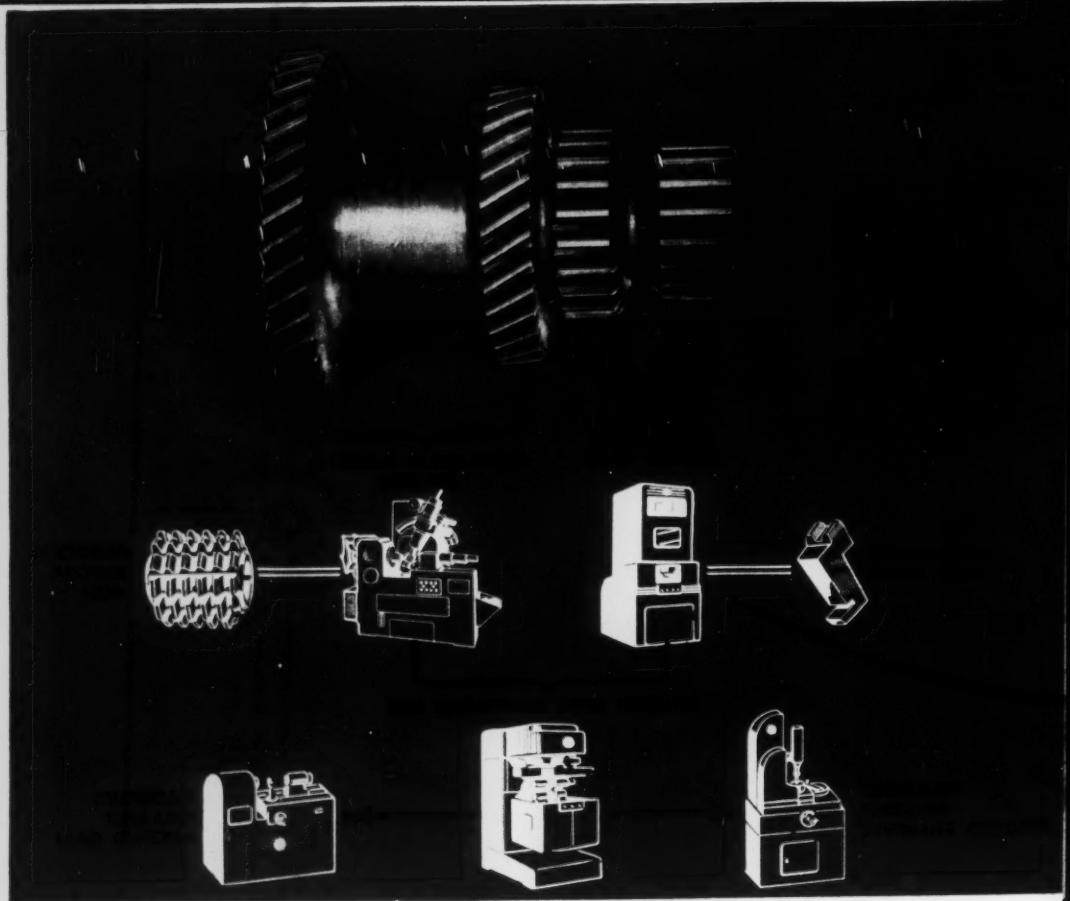
Result? The Kidde Company now has eight new machines on order with Warner & Swasey—which will give them a total of fourteen 1-AC's!

Warner & Swasey 1-AC Single Spindle Automatic Chucking Machines in use at Walter Kidde & Company, Inc., a leading manufacturer of fire extinguishing apparatus, textile machinery, aircraft and marine equipment.

WARNER & SWASEY
Cleveland

YOU CAN MACHINE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY TURRET LATHES, AUTOMATICS, AND TAPPING MACHINES

				(as shown below) **gear**	
81 seconds	67 seconds	38 seconds	48 seconds	Estimated cutting time	**cutting**
32/hr.	37/hr.	56/hr.	48/hr.	Gears / hr. at 85% eff. per machine	
60 seconds	50 seconds	48 seconds	45 seconds	Estimated cutting time	**finishing**
41/hr.	47/hr.	48/hr.	51/hr.	Gears / hr. at 85% eff. per machine	



YOU CAN GET PRODUCTION LIKE THIS

ON GEARS LIKE THESE

TOOLED WITH THESE MACHINES

THE TIME TO PLAN YOUR GEAR PRODUCTION....

The best gears are produced at the lowest cost when (a) each production step is tooled for maximum efficiency and (b) all steps of the line are properly "coordinated"—from blank to finished gear.

That is where Michigan Tool Company comes in.

That is why we have developed so complete a line of gear production equipment—machines and tools for practically every step, including gear cutting, finishing and control of quality.

We would like to help you improve your "line coordination," help you cut costs and rejects, increase output per machine and man hour, improve quality.

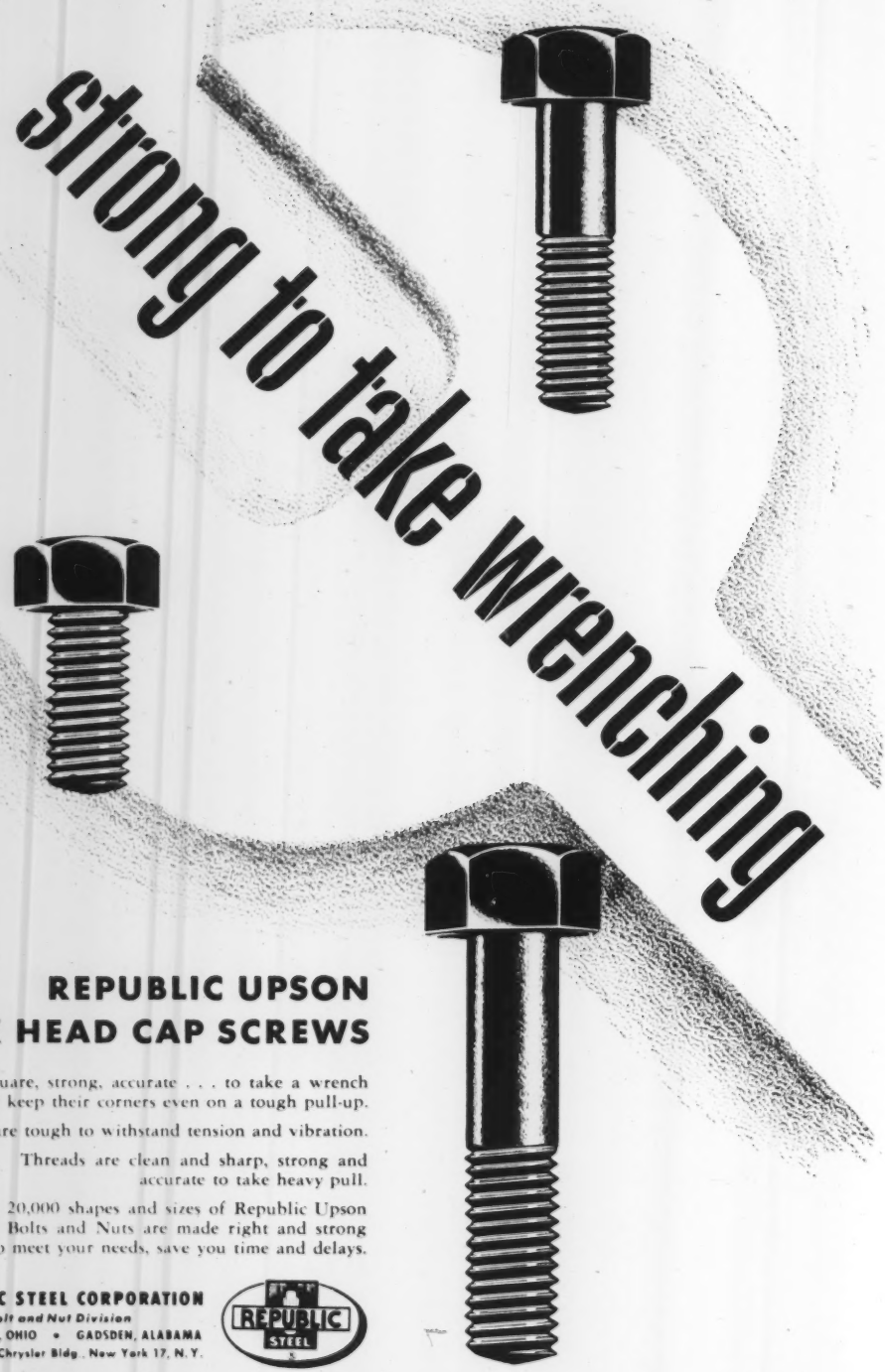
An invitation from you to have one of our engineers visit your plant and discuss your plans and problems with you will be appreciated.

May we hear from you?

MICHIGAN TOOL Company

from blank to finished gear

ROIT 12, MICHIGAN, U. S. A.



REPUBLIC UPSON HEX HEAD CAP SCREWS

Heads are square, strong, accurate . . . to take a wrench snugly and keep their corners even on a tough pull-up.

Shanks are tough to withstand tension and vibration.

Threads are clean and sharp, strong and accurate to take heavy pull.

All 20,000 shapes and sizes of Republic Upson Bolts and Nuts are made right and strong to meet your needs, save you time and delays.

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When you look for electric motors . . . look for the Fairbanks-Morse seal. For over 120 years it has stood for the finest in manufacturing integrity—to *all* industry. Fairbanks, Morse & Co., Chicago 5, Ill.

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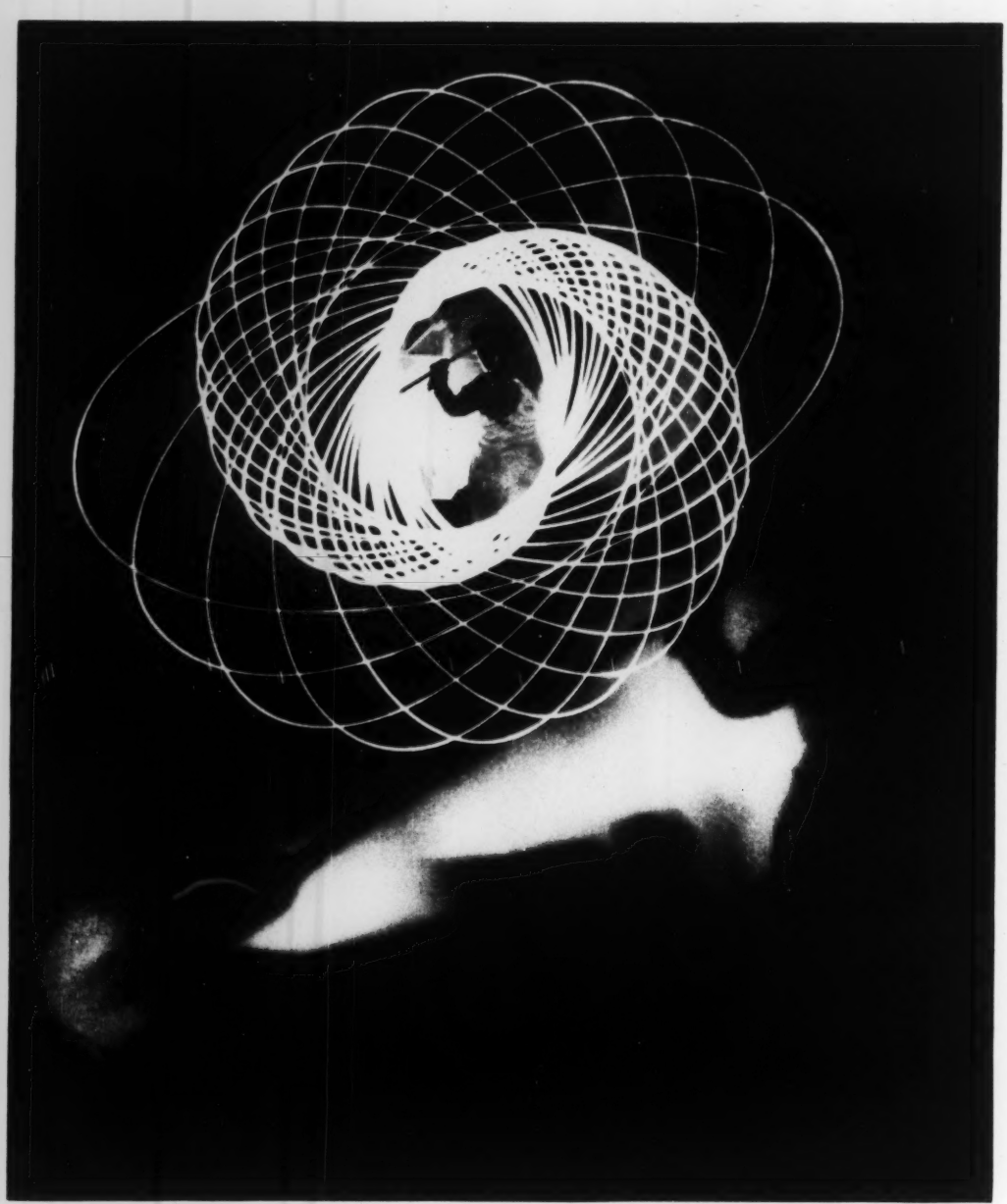

TITANIUM ALLOYS, produced by TAM, are used successfully as deoxidizers and stabilizers and as a source of titanium in steels and alloys. The experience gained in their development and use is available to you through our field staff and laboratory. It's yours by simply writing our New York City office.

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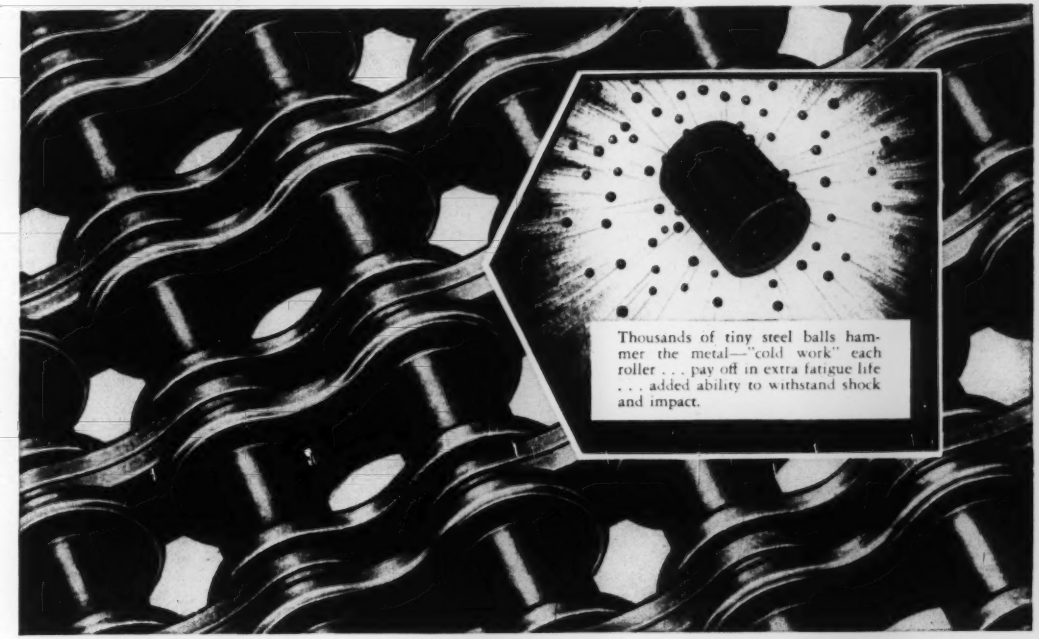
Get the roller chain that gives you SHOT-PEENED rollers...


Thousands of tiny steel balls hammer the metal—"cold work" each roller . . . pay off in extra fatigue life . . . added ability to withstand shock and impact.

look for the darkened rollers!

THERE are sound reasons for the universal acceptance of Link-Belt Precision Steel Roller Chain. Two of them—shot-peened rollers and Lock-type Bushings—are shown here.

Others include Link-Belt's rigid material selection and controlled heat treating—your assurance of absolute uniformity with no weak members.

Whether it's for drive or conveyor service, you can get the best in roller chain from the complete Link-Belt line—single and multiple widths, in $\frac{3}{8}$" through 3", and double pitch, 1" through 3". Next time you need roller chain, call the Link-Belt office near you.

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PRECISION STEEL ROLLER CHAIN

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in Principal Cities. 12,697

Lock-type Bushings increase ability to withstand shock loads

A special manufacturing process securely locks the inside sidebars on the bushing, preventing lateral movement of the sidebars and eliminating a common cause of stiff chains. This Link-Belt development is applied on roller chains through 1" pitch and double pitch roller chains through 2" pitch.

An Open Letter of Thanks to V.I.P.*

H. D. PAXSON, PRESIDENT
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Specializing in Slitting Lines
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Thanks to you *VERY IMPORTANT PEOPLE for giving us the users' point of view in developing Paxson Slitting Equipment.

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Appreciatively yours,

PAXSON MACHINE COMPANY

H. D. Paxson

H. D. Paxson, President

HDP/t

"PAXSON GIVES YOU THE EDGE"
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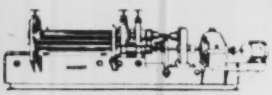
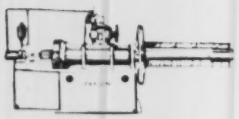


SLITTERS

COILERS



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FLAT SPRING STEEL

You can get it now! . . . and we believe it's the best spring steel we've ever made

OUR NEW specialty spring steel plant is in full swing. Equipped with today's most modern, precision machines, we believe we're producing flat spring steel that gives more for your money than ever before.

This new spring steel is tops in uniformity. It saves you preparation time . . . cuts down machine stoppages . . . gives you the greatest number of perfect parts from every foot and pound of steel.

With our greatly increased capacity we can make prompt deliveries on flat spring steel. And if you need high carbon round or shaped wire, ask what we can do. John A. Roebling's Sons Company, Trenton 2, N. J.

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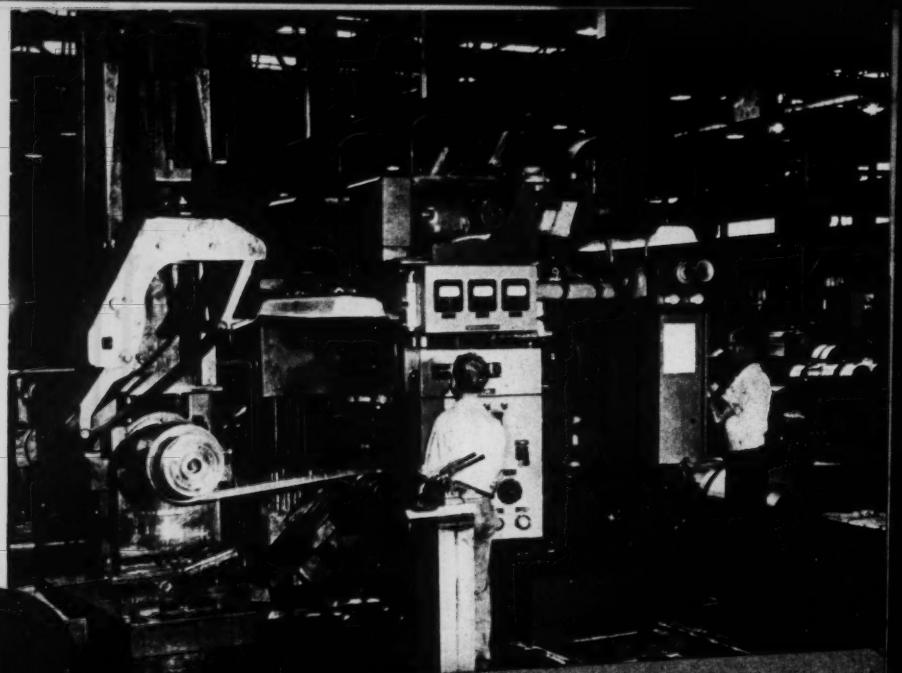


2 new BLISS mills

and do it better at Chase...

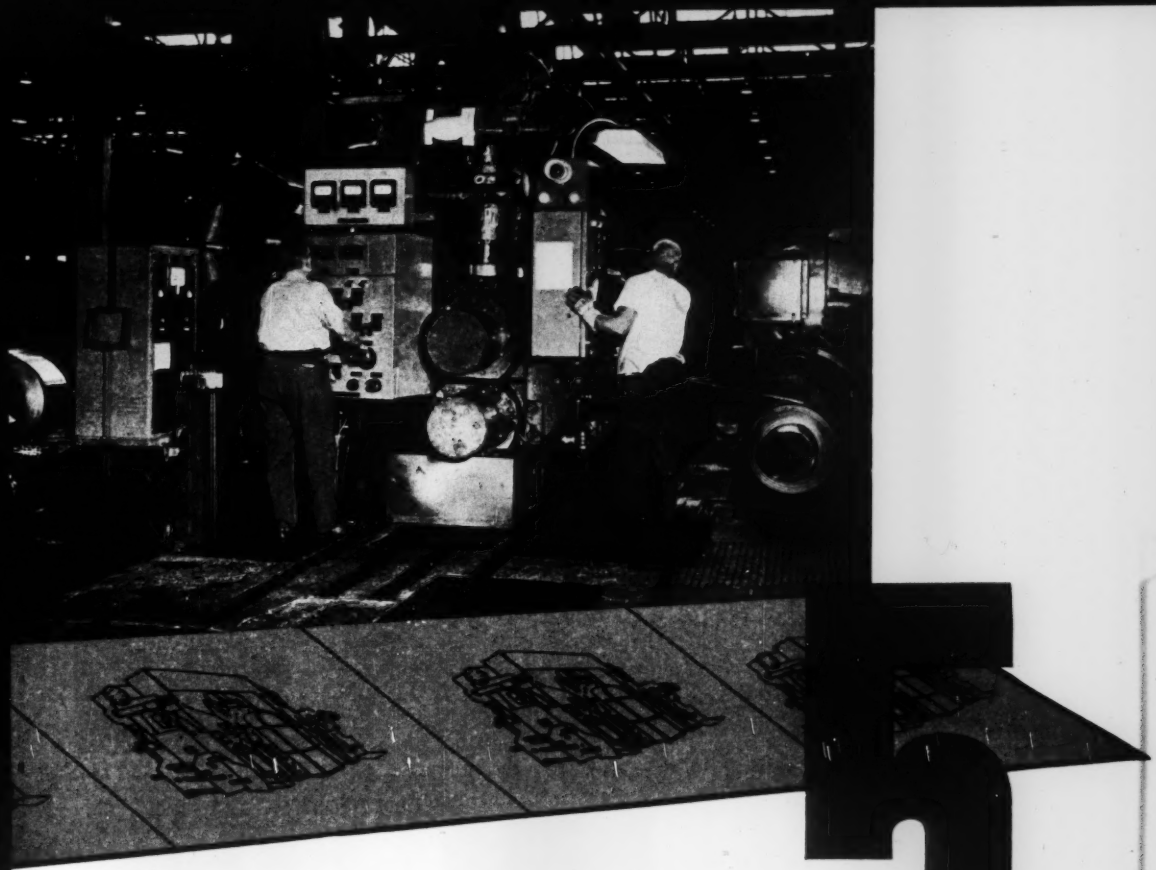
Higher production...closer tolerances...*less equipment*...all these are now a reality at the Chase Metal Works plant of Chase Brass & Copper Co., subsidiary of Kennecott Copper Corporation.

Chase wanted mills that would take a 50% reduction on brass strip at 500 fpm; and auxiliary equipment to handle coils weighing 200 lbs. per inch of width.

Bliss designed and built a pair of two-high mills, one 16″ x 16″ and the other 20″ x 22″, to suit various widths. Now quality and quantity of output from the new Bliss mills exceed that of the *five* old mills.

The Bliss mills run up to 1000 fpm and easily hold tolerances to 0.0005″; and these speeds offer quite an advantage on finish passes.

The 50% reduction made on Bliss mills is *twice* the amount possible on the old equipment. The Bliss units, with capacity of 200 lbs. per inch of width, handle 2400-lb. coils (for 12″ strip) on the



do the work of 3

16″ mill, and 3600-lb. coils (for 18″ strip) on the 20″ mill.

Bliss engineers sought carefully to include in the designs the desired characteristics of a mill suitable for reduction and finish rolling. The planished surface obtained is so good that further buffing is unnecessary.

If you have a rolling mill production problem, you'll find as Chase did—that it pays to call in Bliss. Take the first step toward increased production: write for your copy of the 52-page brochure, "Rolling Mills and Accessories," Bulletin 40.

E. W. BLISS COMPANY · General Office: Canton, Ohio
ROLLING MILL DIVISION: SALEM, OHIO
E. W. Bliss (England) Ltd., Derby, England
E. W. Bliss Company (Paris), St. Ouen sur Seine, France

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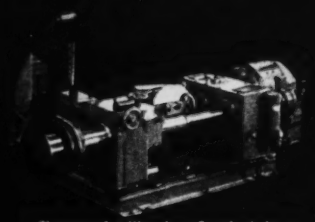
Other dealers in United States cities and throughout the world.

Remember: **for Presses, ROLLING MILLS and Special Machinery...**

It's Bliss

THIS WF WIRE FLATTENING TEAM

. . . SQUEEZES "DOWN-TIME", TOO



Close-up of a Waterbury Farrel winder at the delivery end of a WF Tandem Mill. Winder is provided with pneumatic clamping of reels. It has three adjustments for width of wire and width and positioning of drum or spool.

This complete Waterbury Farrel mill package includes 10" and 8½" Tandem Wire Flattening Mills, power driven double head Pay-off, Edger, Winder, footage counter, continuous thickness and width gauges and automatic electrical synchronizing control. Other WF tandems with up to five mills available.

Modern Waterbury Farrel Mill Design Insures High Production Plus Precision . . . Minimizes "Down-Time"

Here are some reasons why Waterbury Farrel Wire Flattening equipment can give you *more continuous*, high speed, precision production.

- Loading payoff and motor driven screwdowns for mills and edgers facilitate threading of wire with minimum effort and time.
- To protect precision operation, soluble oil is circulated internally and externally on the rolls and into coolant enclosures where wire is submerged. A refrigeration system maintains the coolant oil temperature at approximately 70° while a flotation unit keeps it clean and fresh. In addition, high speed mills also have a self-contained, automatically-filtered circulating mineral oil lubrication system for roll necks and drives.
- Transparent lucite covers at vital lubrication points such as gear cases and universal joints make it easy to check lubrication at a glance.
- Anti-friction bearings are used for all rotating members including the winder shaft. High precision anti-friction bearings are used on roll necks and edger arbors. This, combined with precision fitting of component parts enables WF mills to maintain tolerances well inside commercial allowance.
- Tungsten carbide ring rolls permit rolling the toughest alloys and increase roll life.
- Electric control keeps wire tension constant. Dancer rolls are used for fine wire.

Waterbury Farrel designs and builds a wide range of wire flattening mill equipment to suit specific requirements. Various sizes and combinations of single and multiple mill stands with auxiliary equipment are available for flattening ferrous and non-ferrous wire from the smallest diameters to 1" diameter and more. Speeds range up to and above 2500 FPM.

Write for further information.

WATERBURY FARREL FOUNDRY & MACHINE CO.
WATERBURY 20, CONN.
***Sales Offices:* Chicago, Cleveland, Millburn, N. J.**

WATERBURY FARREL FOUNDED 1851

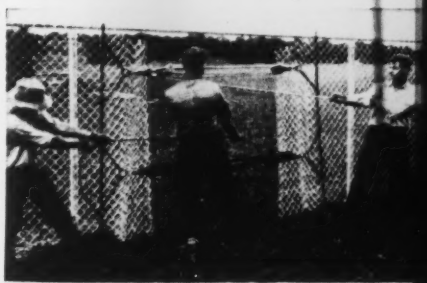
A FEW OF THE MANY TYPES OF METAL WORKING MACHINERY MADE BY WATERBURY FARREL

MILL MACHINERY—Rolling Mills: Strip, Rod, Wire Flattening, (For Ferrous and Non-Ferrous Metals) • Also Slitters • Straighteners • Cut-off Saws • Coilers • Winders, etc. *WIRE MILL EQUIPMENT*—Continuous Wire Drawing Machines (Upright Cone and Tandem) • Wire Flattening Mills • Chain Draw Benches • Pointers Swagers • Bull Blocks • String-up Machines • Spoolers, etc. *COLD PROCESS BOLT & NUT MACHINERY*—Headers (all types) • Rivet Machinery • Trimmers • Thread Rolling Machines • Slotters • Nut Formers and Tappers, etc. *POWER PRESSES*—Crank, Cam and Toggle; also Rack and Pinion Presses • Eyelet Machines Multiple Plunger Presses • Horizontal and Hydraulic Presses, etc.

PROVIDE YOUR OWN SECURITY PROGRAM with *CONTINENTAL *Chain Link* FENCE...

Today, every plant needs security protection—to guard against dollar losses—to prevent sabotage, thievery and accidents. There is no substitute for a sturdy, long-lasting chain link fence to provide maximum safety for minimum investment. Continental chain link fence is well known for its staying-power. This rugged, open hearth steel fence is weatherproofed, after weaving, in a bath of hot zinc, There's a lifetime of protection and peace-of-mind in every foot of Continental chain link fence. Write for our free fence manual . . . or contact the nearest Continental sales office . . . find out how Continental fence can give you a low-cost security program.

Continental's experienced fence engineers help you plan and lay out fence, tailored to fit your property.



Line posts are solidly set in concrete—fabric carefully stretched and secured for permanence.

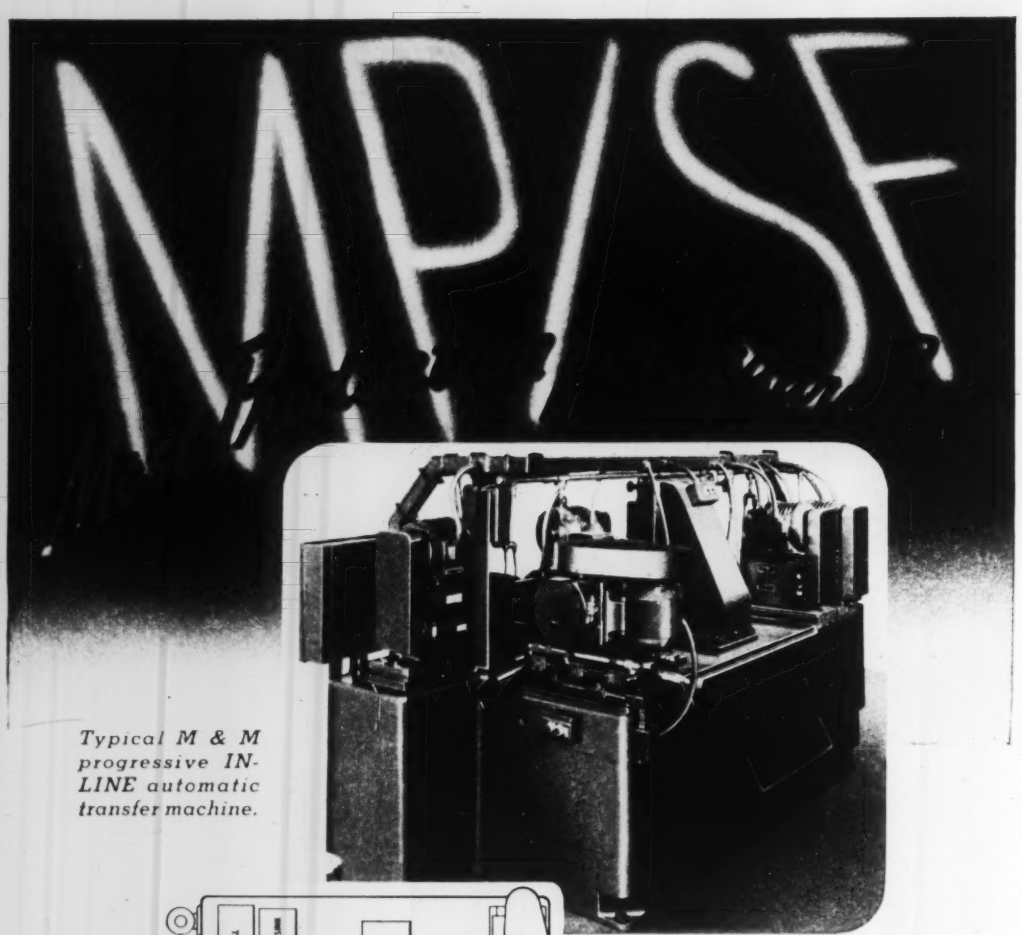
*TRADE MARK REG. U. S. PAT. OFF.

CONTINENTAL STEEL

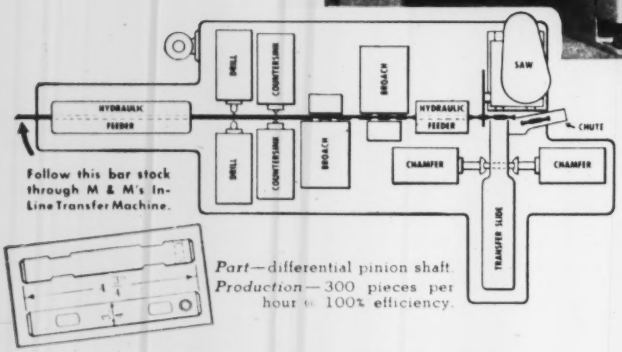
CONTINENTAL STEEL CORPORATION

GENERAL OFFICES • KOKOMO, INDIANA

PRODUCERS OF *Manufacturer's Wire* in many sizes, shapes, tempers and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, Lead Coated, and special wire. ALSO, Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.



Typical M & M progressive IN-LINE automatic transfer machine.



Follow this bar stock through M & M's In-Line Transfer Machine.

Part—differential pinion shaft.
Production—300 pieces per hour @ 100% efficiency.

Motch & Merryweather's forward-looking design *unitizes* a number of operations in the same machine. You obtain maximum usable production per square foot of floor space. Furthermore, you effect the greatest possible savings in time, overhead and operating costs.

Manufactured by —THE MOTCH & MERRYWEATHER MACHINERY CO.—

CLEVELAND 13, OHIO

Builders of Circular Sawing Equipment, Production Milling, Automatic and Special Machines

PRODUCTION-WITH-ACCURACY • MACHINES AND EQUIPMENT

IN VAPOR DEGREASING

WHEN SO MUCH

DEPENDS ON A QUALITY SOLVENT

IT PAYS TO SPECIFY

SPEEDY, DEPENDABLE...

"TRICLENE" D Trichlorethylene is the result of over 20 years of research and practical experience in the degreasing field. Made under carefully controlled conditions by the pioneer manufacturer of degreasing solvents in the U. S., each shipment of "Triclene" D is carefully pretested for stability and purity... must meet test standards higher than those established by military and federal specifications (MIL-7003 and O-T-634). Yet "Triclene" D costs no more than other leading brands of degreasing solvents.

"Triclene" D is available nationally in 55 gallon drums and tank cars of various sizes. Distribution points in over 100 principal cities are ready to serve you with prompt deliveries. And trained Du Pont technical representatives with broad experience in the field will be happy to work closely with you in keeping your degreasing installations operating at peak efficiency.

E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Dept., Wilmington 98, Delaware.

Send for your copy of "Vapor Degreasing with Du Pont Non-Flammable Solvents." It shows you how and where "Triclene" D can be used to save time and cut costs in metal cleaning.

E. I. du Pont de Nemours & Co. (Inc.)
Electrochemicals Dept., Wilmington 98, Delaware

Please send me detailed information on Vapor Degreasing: applications, advantages, equipment used . . . and more facts on Du Pont "Triclene" D. We are interested in cleaning____products.

Name_____ Position_____

Firm_____

Street & No._____

City_____ State_____

DU PONT REG. U.S. PAT. OFF. 150th Anniversary

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

What's new about U. S. Rubber's Royalite® Hard-Shell Cup Wheel?

Taking off the rough edges is just one of many grinding functions this U.S. Royalite Hard-Shell Cup Wheel performs.

The wheel has an entirely new design feature — an encircling rim of extra tough wear-resistant construction around the free cutting face — which prevents the cutting edge from becoming rounded. Hard-to-reach corners can be accurately ground because the edge does not break down. U. S. Rubber's 89 years of abrasive experience enables their engineers to design, when necessary, and recommend the grinding wheel that will finish your job expertly and economically.

PRODUCT OF U.S.RUBBER SERVING THROUGH SCIENCE

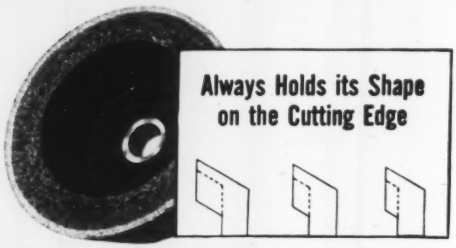


Diagram shows how the grinding face wears down evenly and the outer cutting edge remains sharp.

UNITED STATES RUBBER COMPANY

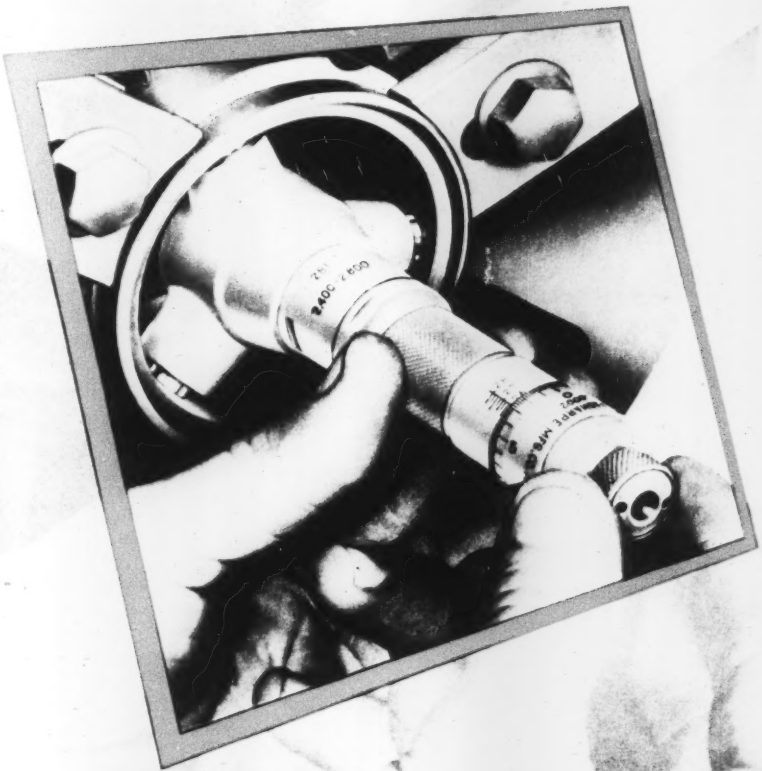
MECHANICAL GOODS DIVISION • ROCKEFELLER CENTER, NEW YORK 20, N. Y.

B·S **Productioneered**

For Low-Cost Direct Measuring of Bores and Holes

New INTRIMIK

Internal Tri-Point Micrometer



Now you can realize new economies and speed by measuring bores and holes with the Brown & Sharpe Intrimik. It's a precision micrometer . . . not a comparator. Takes measurements directly. Intrimik eliminates the need for many expensive plugs and setting rings . . . it is "Productioneered" to cut costs and speedup machining of work requiring inside measurements. Every feature for convenience, precision, and long service life has been incorporated in its design and construction.

- As easy to read as a conventional micrometer . . . measures bore or hole size accurately, disclosing exact amount of metal to be removed.
- Ratchet stop provides correct and unvarying measuring pressure.
- Self-aligning, axially and radially . . . three active measuring points automatically centralize tool in bore.
- Extremely rigid . . . no interchanging of parts (except for extensions).

SEE NEXT PAGE FOR RANGE OF SIZES

Brown & Sharpe

B·S Productioneered

to measure ANY size bore or hole within range of tool . . .

New INTRIMIK

Internal Tri-Point Micrometer

The Brown & Sharpe Intrimik gives you a handy means of measuring inside diameters in increments of .0001" on bore sizes from .275" to .500"; and in increments of .0002" on bore sizes from .500" to 4.000". Where measurements must be taken over a range of sizes, Intrimik offers tremendous savings over plug and comparator type gages.

WIDE RANGE OF SIZES

Intrimik is furnished in 16 individual sizes, and also in four sets to cover all measurements from .275" to 4.000". Measurements at depths of 2" can be made with the three smaller sizes, and 3" with the larger sizes. Extensions are available to measure at depths up to 6" with the smaller sizes, and up to 9" with the larger. For even greater depths, two extensions may be used.

Write for the illustrated Bulletin describing the new Intrimik.

Intrimik with single extension for measuring deep holes.

WE URGE BUYING THROUGH THE DISTRIBUTOR

Brown & Sharpe

BROWN & SHARPE MFG. CO., PROVIDENCE 1, R. I., U. S. A.

Milling Machines • Grinding Machines
Screw Machines • Machine Tool Accessories
Cutters • Machinists' Tools
Electronic Measuring Equipment
Johansson Gage Blocks
Permanent Magnet Chucks • Pumps

"It's foolish to try to be bigger than you are"

REMEMBER Aesop's fable of the frog and the ox? Told 2,500 years ago, it goes:

"Three young frogs cried to their mother that a little brother had been trampled by the largest beast in the swamp. 'Oh, no,' said the mother, 'no beast is larger than I.' And she blew herself up to show how big she really was. 'But it was much bigger,' the little ones chorused. Whereupon the vain mother inflated herself until she burst." And the moral was, "It's foolish to try to be bigger than you are."

Aside from the wisdom of the fable for each of us individually, there is solemn warning for us as a nation. Some among us seem to believe that with an unlimited supply of taxpayers' dollars America can buy anything--ease and security at home, acceptance of our ideas abroad, friendship of other peoples, even world peace.

Like the vain frog, America inflates herself more and more dangerously, trying to stretch herself to be the biggest thing in the swamp. Meanwhile the enormous beast that is the world goes its own way, scarcely affected by the vainglorious display of America's inflation. It's the same old world that was indifferent before the pomp of Egypt, Persia, Greece and Rome.

How will our present "puffing" end? Isn't it obvious that continued inflation can bring disaster? Only by a realistic policy of living within our means--not trying to be bigger than we are--can America avoid the catastrophe of Aesop's foolish frog.

YOUR SCRAP IS NEEDED — YOUNGSTOWN

The Youngstown Sheet and Tube Company

General Offices--Youngstown 1, Ohio

Export Offices--500 Fifth Avenue, New York

MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

The steel industry is using all its resources to produce more steel, but it needs your help and needs it now. Turn in your scrap, through your regular sources, at the earliest possible moment!

good judgment calls for

PARKER-KALON®

when good design calls for

SOCKET SCREWS

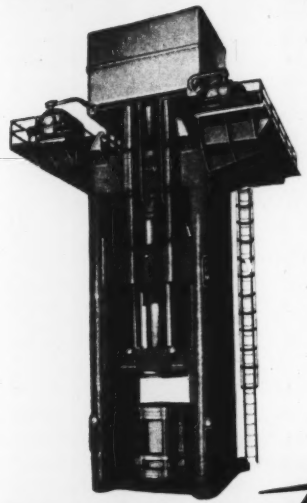
P-K SOCKET SCREW BULLETIN

16 pages, describes all types, lists sizes, and illustrates quality control back of P-K guarantee. Free on request from your local P-K Distributor. Ask for samples. See why P-K Socket Screws take top honors in any test. Parker-Kalon Corporation, 200 Varick St., New York 14.

75th year

Serving Industry With All-Hydraulic Machines For Every Pressure Processing Need!

HPM



thank you . . .

METALWORKING INDUSTRY . . . your continued confidence in H-P-M and the all-hydraulic presses and power equipment we build has made this our 75th anniversary possible.

Through advanced research and proper application of the knowledge we have gained through 75 years of specialized experience in our chosen field, hydraulics, we shall continue to design and build the all-hydraulic pressure processing equipment best suited to your requirements.

THE HYDRAULIC PRESS MFG. COMPANY

1044 MARION ROAD

MOUNT GILEAD, OHIO, U. S. A.

F&Y CONTINUOUS STRIP PICKLING LINE

NEW · EFFICIENT · ECONOMICAL

Complete line equipment with latest improved operating features. Maximum volume production with minimum floor space requirements.

If you are interested in a new installation or improving your present equipment why not investigate the Youngstown Line!

these features

- ☐ Coil Box with Strip Opener.
- ☐ Triple Processor with Roller Leveller.
- ☐ Flash Welding and Mechanical Stitching.
- ☐ Single Cycle Up-Cut Shears.
- ☐ Heavy Duty Rubber Covered, Brick Lined Steel Tanks.
- ☐ Magnetic Loop Control for Acid Tanks.
- ☐ Fume Exhaust System—Koto Clone Scrubber.
- ☐ Automatic Control System for Temperature and Acid Proportioning.
- ☐ Side Trimmer with Scrap Cutting or Balling.
- ☐ Up-Coiler with Strip Oiling System.
- ☐ Entry and Exit Coil Conveyors.

The Youngstown Foundry & Machine Co. F&Y

OVER SIXTY YEARS OF SERVICE TO THE STEEL INDUSTRY

Youngstown, Ohio 9

LINE-O-POWER STRAIGHT LINE DRIVES
FOOTE BROS — LOUIS ALLIS GEARMOTORS
HYGRADE HORIZONTAL WORM GEAR DRIVES
MAXI-POWER HELICAL GEAR DRIVES
VERTICAL WORM-HELICAL GEAR DRIVES

DRIVES *for every power transmission need...*

Whatever your requirements in enclosed gear drives, you will find the one best suited to your needs in the complete Foote Bros. line.

Here are compact gearmotor and speed reduction units, ideal for use on original equipment. Heavy duty worm gear drives designed to stand up under tough service. Helical gear drives available in capacities of over 1500 h.p.

The latest in gear-cutting equipment, newest manufacturing techniques, better control of material—all backed by nearly a century of experience—assure you high quality enclosed gear drives.

Bulletins are available on drives to meet every need. Check the ones you want on the coupon below.

LINE-O-POWER STRAIGHT-LINE DRIVES

Economical in original cost and operation. Duti-Rated Gears have file-hard tooth surfaces and ductile cores, assuring long life. Double or triple reductions, with ratios from 5 to 1 up to 238 to 1 and capacity range from 1 up to 175 horsepower.

FOOTE BROS.—LOUIS ALLIS GEARMOTORS

A compact line of gearmotors in 17 sizes in single, double and triple reductions, incorporating Duti-Rated Gears that assure long wear life and maximum load-carrying capacity. Available with Louis Allis open drip-proof, splash-proof, enclosed and explosion-proof motors.

HYGRADE WORM GEAR DRIVES

Heavy duty drives with precision worm gearing that assures high efficiency and load-carrying capacity. Horizontal, vertical and Hytop (extended shaft) types. Ratios from 4⅛ to 1 up to 4108 to 1. Capacities up to 260 horsepower.

MAXI-POWER HELICAL GEAR DRIVES

Heavy-duty helical gear drives. Available in single reduction units, ratios up to 9.91 to 1; capacities up to 1550 horsepower; double-reduction units, ratios from 9.32 up to 71 to 1, capacities to 1100 horsepower; triple reduction units, ratios from 79 up to 360 to 1, capacities up to 420 horsepower.

WORM-HELICAL GEAR DRIVES

Heavy duty vertical drives with horizontal input shafts and vertical output shafts—up or down. Ratios from approximately 25 to 285 to 1 and a capacity range up to 128 horsepower.

FOOTE BROS.

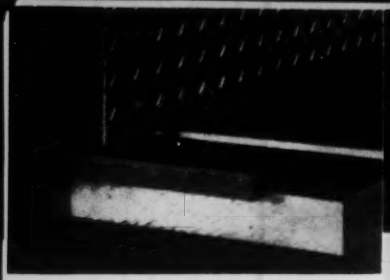
Better Power Transmission Through Better Gears

FOOTE BROS. GEAR AND MACHINE CORPORATION
4545 South Western Boulevard • Chicago 9, Illinois

FOOTE BROS. GEAR AND MACHINE CORPORATION
Dept. X, 4545 South Western Boulevard, Chicago 9, Illinois

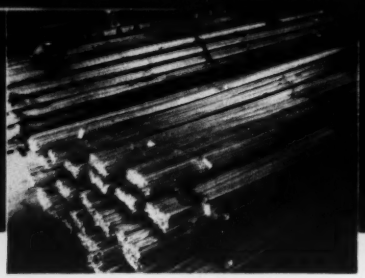
- ☐ Bulletin HGB Hygrade Worm Gear Drives
- ☐ Bulletin LPB Line-O-Power Straight Line Drives
- ☐ Bulletin MPB Maxi-Power Helical Gear Drives
- ☐ Bulletin GMA Foote Bros—Louis Allis Gearmotors
- ☐ Bulletin WHA Worm-Helical Gear Drives

Name.....*Position*.....
Company.....
Address.....
City.....*Zone*.....*State*.....



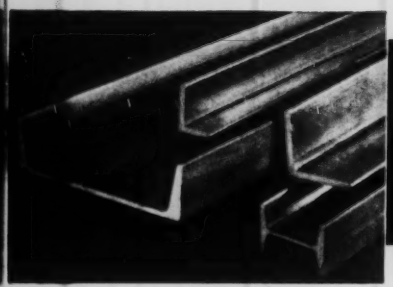
SHEET AND PLATE: Flat and coiled sheet; circles; patterned sheet; plate; tread plate; roofing and siding sheet; roofing accessories and fasteners; specialty sheet.

WIRE: Coiled and straight lengths; rivet wire; flattened and slit wire.

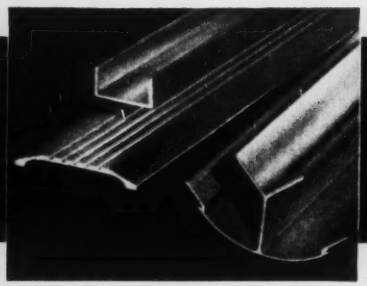


SCREW MACHINE STOCK: All free-cutting alloys plus the higher strength alloys—24S, 61S and 75S.

These are the MILL PRODUCTS of ALCOA

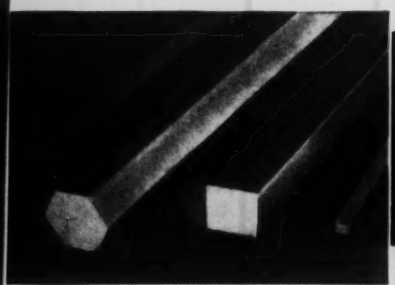


ROLLED SHAPES: Equal angles; unequal angles; channels; I-beams; H-beams, Tees, Zees.

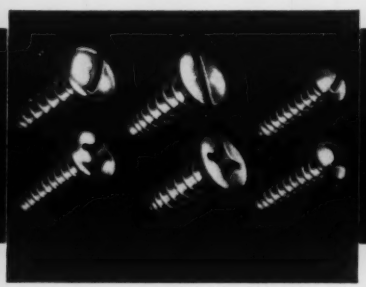


EXTRUDED SHAPES: Miscellaneous extruded shapes such as angles, channels, half rounds, quarter rounds, thresholds, truck corners and structural members, etc. Round, square,and rectangular bars.

TUBE AND PIPE: Coiled tube; straight tube in round, square and rectangular shapes; heat exchanger tubes; standard pipe and pipe fittings; irrigation pipe; rigid conduit.



BAR STOCK: Square, hexagonal and rectangular bar stock in free-cutting and higher strength alloys.



FASTENERS: Machine screws; wood screws, washers; nuts; bolts; rivets.

WELDING AND SOLDERING SUPPLIES: Welding and brazing wire; welding and brazing flux; solder flux; solder.

ALUMINUM COMPANY OF AMERICA

They have

these twelve basic advantages and scores of others

- Lightweight
- High Resistance to Corrosion
- High Electrical Conductivity
- High Conductivity for Heat
- High Reflectivity for Light and Radiant Heat
- Workability
- Nontoxic
- Strength in Alloys
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- High Scrap and Re-Use Value

ALCOA

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ALUMINUM

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With them

goes the skill of 64 years' experience in fabricating, assembling and finishing aluminum

The world's greatest aluminum research and testing facilities are available to help you determine the suitability of aluminum for your products. And to train your personnel, Alcoa offers technical literature and how-to-do-it movies.

ALCOA ALSO MAKES PRODUCTS TO CUSTOMER SPECIFICATION

CASTINGS . . .
sand, plaster, permanent mold and die.

FORGINGS . . .
drop, hammer and press forgings.

SCREW MACHINE SPECIALTIES . . .
special fasteners and screw machine parts.

IMPACT EXTRUSIONS

EXTRUDED SHAPES

They are

available from your local ALCOA sales office, distributor or jobber

For all possible co-operation in filling your orders, call your local Alcoa sales office, distributor or jobber. You'll find them listed under "Aluminum" in your classified phone book.

ALUMINUM COMPANY OF AMERICA
1808M Gulf Bldg. • Pittsburgh 19, Pa.

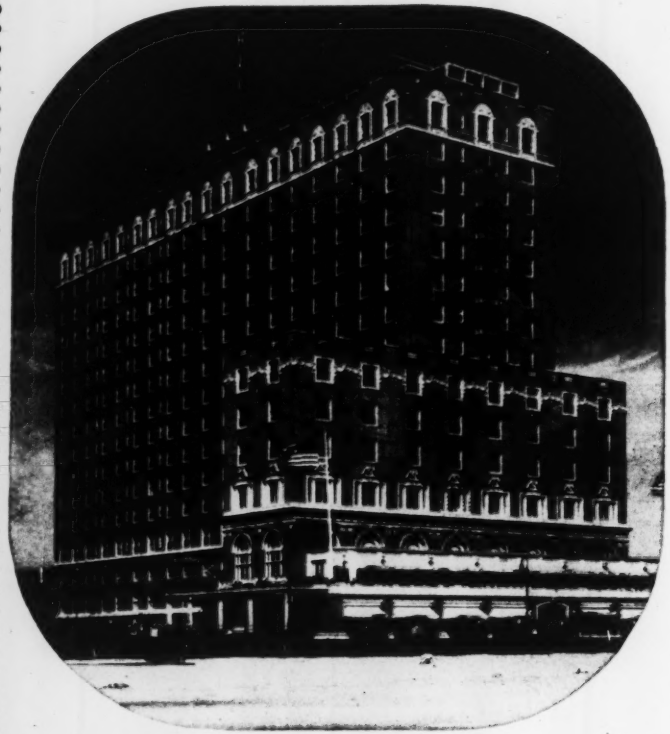
"SEE IT NOW" with Edward R. Murrow — CBS-TV every Sunday . . . brings the world to your armchair. Consult your newspaper for local time and channel.

ALCOA *first in* ALUMINUM

WATER for Atlantic City's RITZ-CARLTON

DATA:

- **WELL**: Drilled by rotary clay-seal process, 850 feet deep in the Kirkwood stratum; double cased and graveled.
- **CASING**: 145 feet of 16" and 747 feet of 12" steel.
- **SCREEN**: 61 feet of 6-guage Armco Iron.
- **PUMPS**: Originally equipped with 4-stage 15" bowls with cast iron impellers. Later replaced with 9-stage 12" bowl and bronze impeller.
- **MOTOR**: Original 25 HP electric still giving good service.



ON ATLANTIC CITY'S famous board walk, stands one of America's loveliest hotels—the Ritz-Carlton. Twenty-eight years ago, the owners turned to Layne for a well and pump installation. In the intervening years—over a quarter century, they have never experienced one fraction of disappointment in the dependability, durability and ever faithful performance of their purchase.

In the twenty-eight years of almost constant operation, the Layne unit has produced more than 1,471,680,000 gallons of water—all the fresh water needed by this great hotel. Upkeep expense since the day installed has averaged less than a hundred and seventy dollars a year. One amazing fact is that the original Armco iron screen is still functioning. Another is that the well was installed by a method that completely sealed off all infiltration of salt water in a most difficult salt water area. Such is the life expectancy, satisfactory operation and generally low upkeep expense of Layne wells and pumps.

For Water Well and Pump Catalogs, write to

LAYNE & BOWLER, INC.

GENERAL OFFICES, MEMPHIS 8, TENN.

Layne

There are Layne Associate Companies located throughout the country. The one near you already understands the drilling and water bearing formations in your area.

WATER WELLS

VERTICAL TURBINE PUMPS

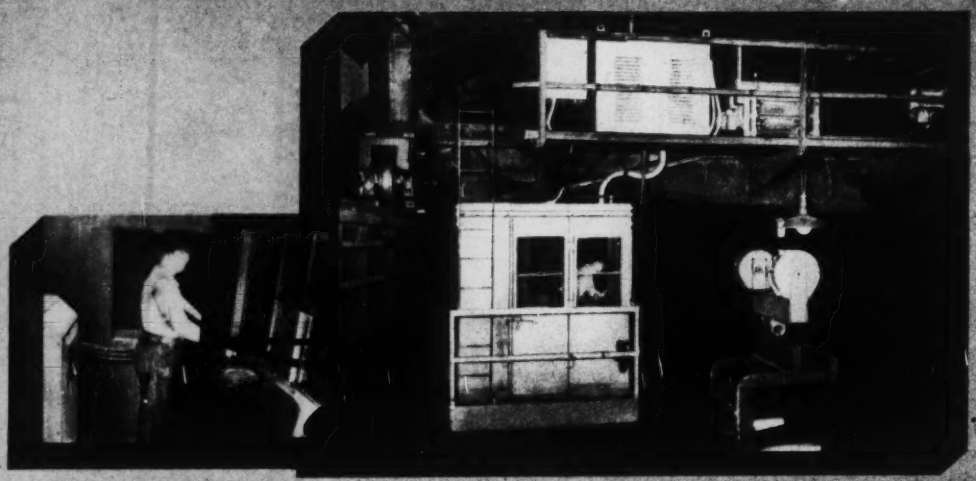
WATER TREATMENT

Experience gained by over 90 years of Roll making * is marked on all . . .

THE ROLL MARK OF EXPERIENCE

LEWIS FOUNDRY & MACHINE
DIVISION OF BLAW-KNOX CO.
PITTSBURGH, PENNA.

CRANE CAB operating temperatures lowered 65° to 70° F. at Hot Slab Mill



DRAVO SPLIT-TYPE CRANE CAB COOLER INSTALLED AT PITTSBURGH STEEL CO.

Hot slab mill operations produce ambient temperatures in summer of 150° F., creating a major working hazard for crane operators working over these "hot spots."

Pittsburgh Steel Company at Monessen, Pa., eliminated this hazard with a Dravo split-type Crane Cab Cooler. With the condenser section mounted on the crane and the conditioning section in the cab, crane cab temperatures are kept at 80° to 85° F. regardless of sudden temperature changes outside. Crane operators are healthier, more alert and more efficient.

CRANE CAB COOLERS PROVIDE YEAR-'ROUND AIR CONDITIONING

Dravo Crane Cab Coolers are ruggedly constructed, factory assembled and pre-tested to provide years of more-than-satisfactory service. All equipment in the unit is readily accessible with ample space for quick and efficient maintenance.

In the various air conditioning functions the crane cab cooler not only filters the air, removes dust, dirt and fumes, but heats the cab in winter, cools it in summer and provides constant ventilation the year around.

AVAILABLE IN SINGLE OR SPLIT-TYPE UNIT: IMMEDIATE DELIVERY

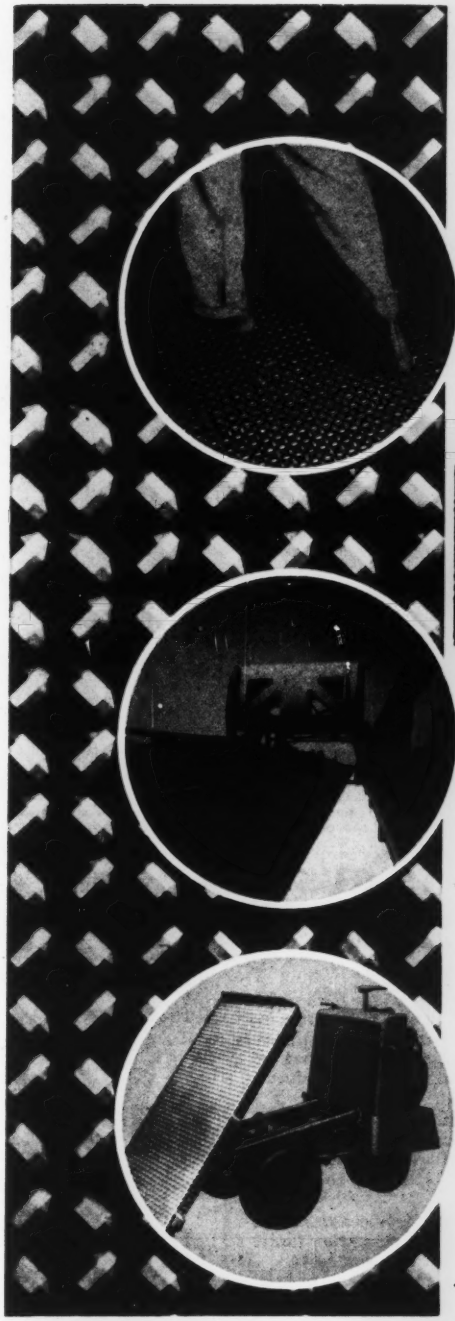
Dravo Crane Cab Coolers are built in two models—the self-contained unit, mounted on any available space on the crane and the new split-type unit where the condenser section is mounted on the crane, with the conditioning section in cab.

The Dravo Crane Cab Cooler can be easily and quickly installed on any type of crane with a minimum of down-time required. Units are available now! Write for more information—or phone the nearest Dravo Office and have our representative call on you.

DRAVO
CORPORATION

606 Dravo Building, Fifth and Liberty Avenues
Pittsburgh 22, Pa.

ATLANTA • BOSTON • CHICAGO • CLEVELAND
DETROIT • NEW YORK • PHILADELPHIA • PITTSBURGH



Got to fill this order fast,
They need it in a hurry—
But, safe on non-skid Multigrip,
He can hurry without worry!

On steps, on ramps, and platforms too—
Wherever danger lurks,
Use Multigrip to make them safe
And help speed up the works.

For safety's sake use U·S·S Multigrip Floor Plate. Multigrip affords sure footing for your workers, positive traction for vehicles. It is durable, neat appearing, easy to keep looking like new. There are no pockets to hold dirt, grease and water. It drains freely, quickly. The flat-topped risers of Multigrip are comfortable underfoot too . . . help reduce fatigue, a major cause of accidents.

UNITED STATES STEEL COMPANY, PITTSBURGH
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, CHICAGO
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

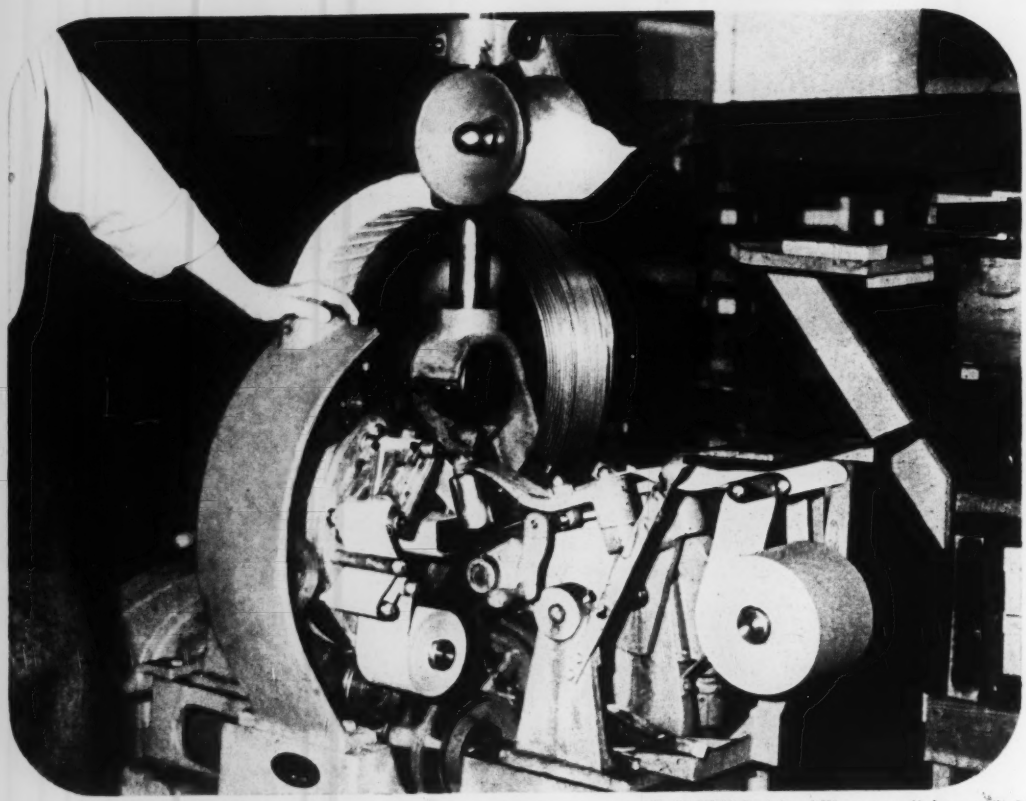
U·S·S
multigrip
FLOOR PLATE

USS

Sold by leading distributors from coast to coast

2-1928

UNITED STATES STEEL



Shell "VPI" Peripheral Wrap as applied to a coil of hard-facing alloys . . . saves expense of removing rust-preventive material . . . reduces packing costs.

New packing technique HALTS RUST DAMAGE . . . cuts packing costs as much as 60%

THE GOOD WORD AMONG steel packagers and shippers today is that rust can now be prevented by Shell VPI* (a volatile corrosion inhibitor). Composed of solid amine nitrites, Shell "VPI" vaporizes and when moisture is present in the air . . . renders this moisture non-corrosive. Containers need not be airtight, however, for excellent corrosion protection.

In terms of packing costs, this new technique is so much simpler and faster that costs have been cut as much as 60%.

This can be traced directly to the fact that Shell "VPI" may be applied quickly and easily in either crystalline form or as a coating on wrapping paper. Hence rust-preventive measures are greatly simplified and container costs are reduced. And, of course, rust removal before the product's use is unnecessary.

Other major advantages of Shell "VPI" are: Low cost . . . Long periods of volatility . . . Non-toxic . . . Elimination of greasing and degreasing . . . Harmless to plastics or ferrous metals.

Consult your Shell Representative about this new method of rust prevention today. Or write to nearest address listed below.

SHELL OIL COMPANY

50 West 50th Street, N. Y. 20, N. Y.
100 Bush Street, San Francisco 6, Calif.

SHELL

SHELL "VPI"

(a volatile corrosion inhibitor)

stops air and moisture from making rust.

JOHNSTON CINDER POTS

have these features . . .

because you asked for them

trend

1. **Distorting effect of unequal expansion and contraction is resisted by EXPANSIBLE RIMS.**
2. **Cracking and inward creep are prevented by CURVED SIDEWALLS.**
3. **Radiating surface and cooling speed have been increased by CORRUGATIONS.**
4. **Capacity of pots now in service runs from 75 TO 500 CUBIC FEET.**
5. **"Stickers" are prevented by optional BOTTOM COATING OF COPPER.**
6. **Support strain at critical section of pots relieved by BOTTOM SUPPORT BRACKETS.**

The unusual features of Johnston Cinder Pots are features that you, the users of our Cinder Pots, have asked for. They are the result of much research and study of your slag disposal problems.

Johnston Patented Cinder Pots have been developed so that they are adaptable to your specific plant requirements—from small units for use with electric furnaces to giant thimbles for blast furnace and open hearth operations.

We will be glad to discuss your slag disposal problems, and help you put Johnston Cinder Pots to work correcting them. For full information, wire, write, or call:

MACKINTOSH-HEMPHILL CO.

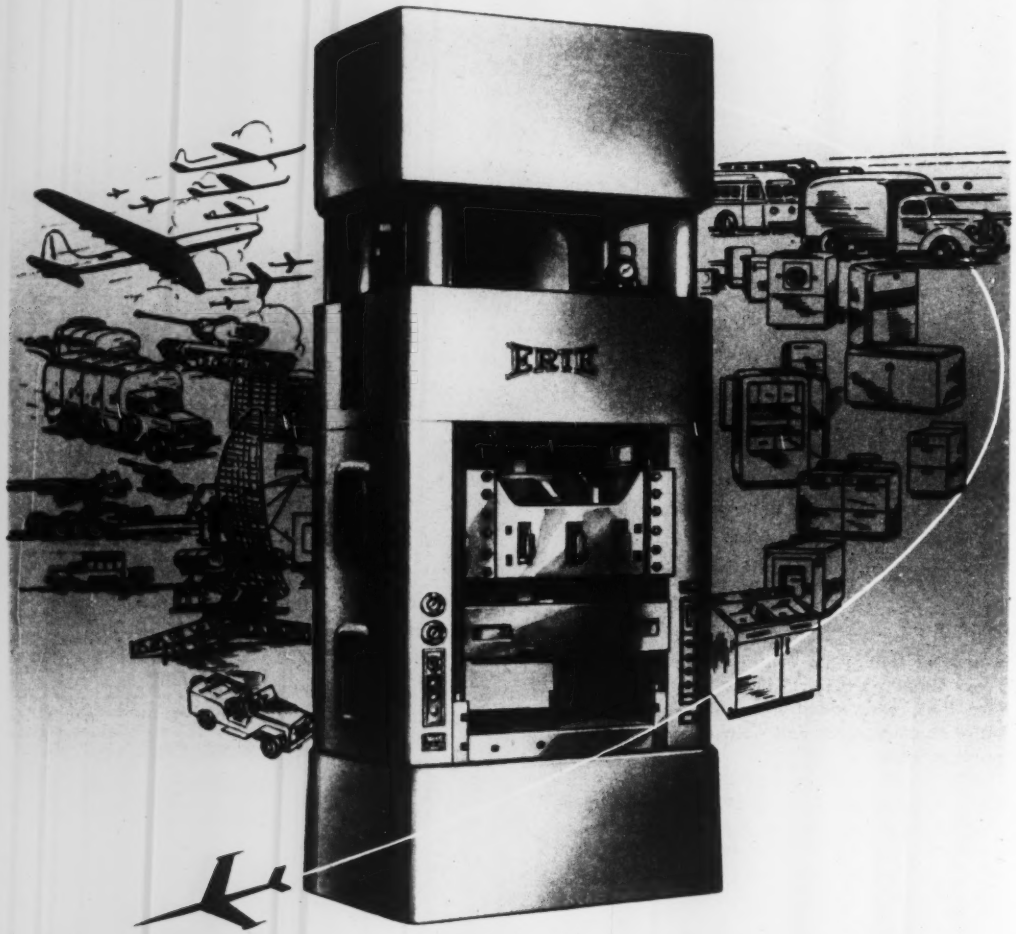
PITTSBURGH 3, PENNSYLVANIA

HEmlock 1-3000

MACKINTOSH-HEMPHILL PRODUCTS INCLUDE: rolls . . . steel and special castings . . . completely integrated strip mills . . . heavy duty engine lathes . . . the new Mackintosh-Hemphill rotary straighteners . . . slag-handling equipment . . . shape straighteners . . . end-thrust bearings shears . . . levellers

ERIE

Hydraulic Metal Forming Presses Make Better Products for Commercial or Defense Use...



ERIE

WHETHER the bulk of your formed metal production is for "guns" or "butter" or a combination of both, it will pay you to consult with our designers and engineers on metal forming equipment. More than a half century of experience stands back of our recommendation. Write for complete details.

ERIE FOUNDRY COMPANY ERIE, PENNSYLVANIA

Dependable **FORGING HAMMERS • HYDRAULIC PRESSES**

Tough...flexible...decorative...

maybe it can give you ideas!

THE material you see above is braided wire. Here at National-Standard it is produced in almost limitless variations . . . flat, tubular, plain, beamed, springlike or untempered, tight or expanded, in many wire sizes, in a great many widths, and of any metal that can be drawn into wire.

At present, the most common uses are for reinforcing pneumatic tire beads, high pressure hose and other rubber products. In these applications its strength and mechanical adhesion qualities are unsurpassed.

Considering its limitless variations and unique qualities, braided wire is bound to have many other effective applications. Perhaps it can save or make money for you! An interesting possibility, for example, is its use with transparent plastics to produce pleasing patterns as well as reinforcement.

If all this gives you an idea you'd like to explore, be assured that National-Standard, as usual, is ready to cooperate with you all the way. Let's talk it over. Just get in touch with the *National-Standard Company, Niles, Michigan.*

NS
NATIONAL-STANDARD
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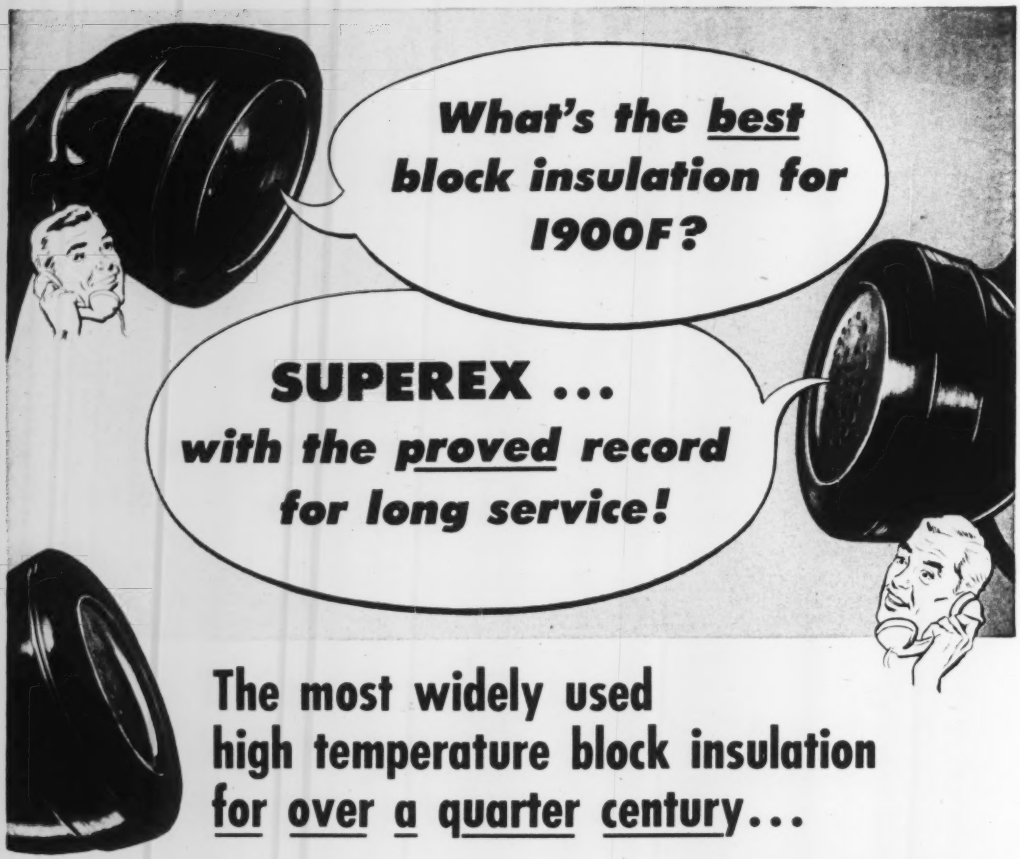
DIVISIONS OF NATIONAL-STANDARD CO.

ATHENIA STEEL	*Clifton, N. J.*	Flat, High Carbon, Cold Rolled Spring Steel
NATIONAL-STANDARD	*Niles, Mich.*	Tire Wire, Stainless, Fabricated Braids and Tape
REYNOLDS WIRE	*Dixon, Illinois*	Industrial Wire Cloth
WAGNER LITHO MACHINERY	*Jersey City, N. J.*	Metal Decorating Equipment
WORCESTER WIRE WORKS	*Worcester, Mass.*	Round and Shaped Steel Wire, Small Sizes



The most widely used high temperature block insulation for over a quarter century...

SUPEREX® high temperature block insulation has long been industry's No. 1 choice for service temperatures up to 1900F. It provides *major* economies . . . reduces fuel costs, cuts heat losses, keeps maintenance expense down, costs less to install and has long service life.

These are the reasons why 90% of the nation's hot blast stoves are Superex insulated . . . and why the low cost open hearth steel producers use Superex in their regenerators.

Made of specially selected and calcined diatomaceous silica blended with other insulating materials and bonded with asbestos fiber, Superex will safely withstand temperatures up to 1900F with negligible shrinkage.

Superex has been used with outstanding success in all types of industrial and metallurgical furnaces and ovens, stationary and marine boilers, auxiliary power plant equipment, regenerators, kilns, roasters, high temperature mains, flues and stacks.

Superex has all these important advantages...

Low thermal conductivity—Exceptionally high heat resistance (1900F) combined with excellent insulating value.

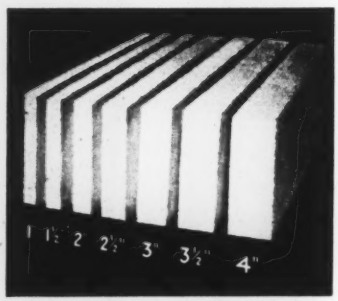
Light weight—Approximately 2 lb per sq ft per in thickness.

Great physical strength—Approximately 6 tons pressure per sq ft are required to compress Superex 1" in.

Long, efficient service life—Superex maintains high insulating value indefinitely—will not disintegrate in the service for which it is recommended.

Fast, easy application—Superex may be cut with an ordinary knife or saw for fitting around openings or to irregular surfaces. Because of its light weight and convenient sizes, Superex assures fast and economical installations.

For complete information about Superex block insulation, write for Brochure IN-134A. Address Johns-Manville, Box 60, New York 16, N. Y. In Canada, write 199 Bay Street, Toronto 1, Ontario.

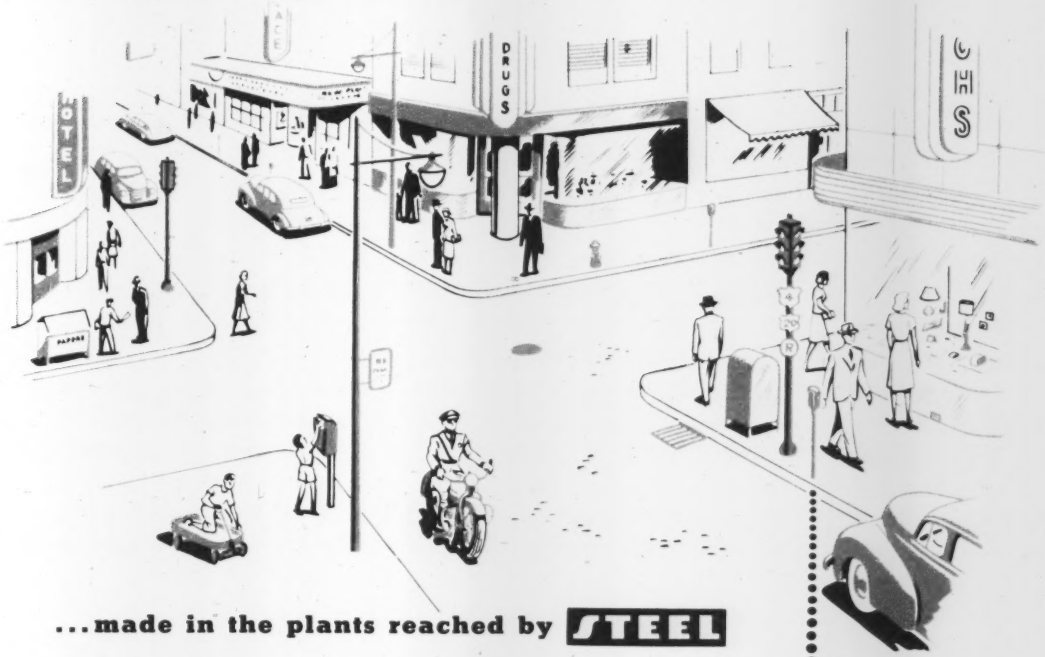


Waste is minimized with Superex because of the variety of thicknesses available. Special shapes and intermediate thicknesses between those shown are also available.

JM Johns-Manville *first in* INSULATIONS

Look up and down Main Street

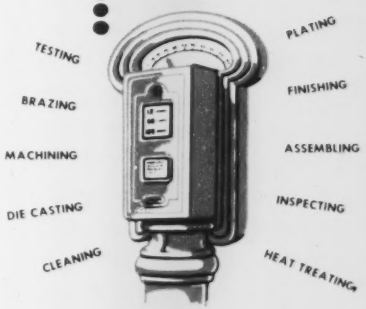
for Metalworking products . . .



. . . made in the plants reached by STEEL

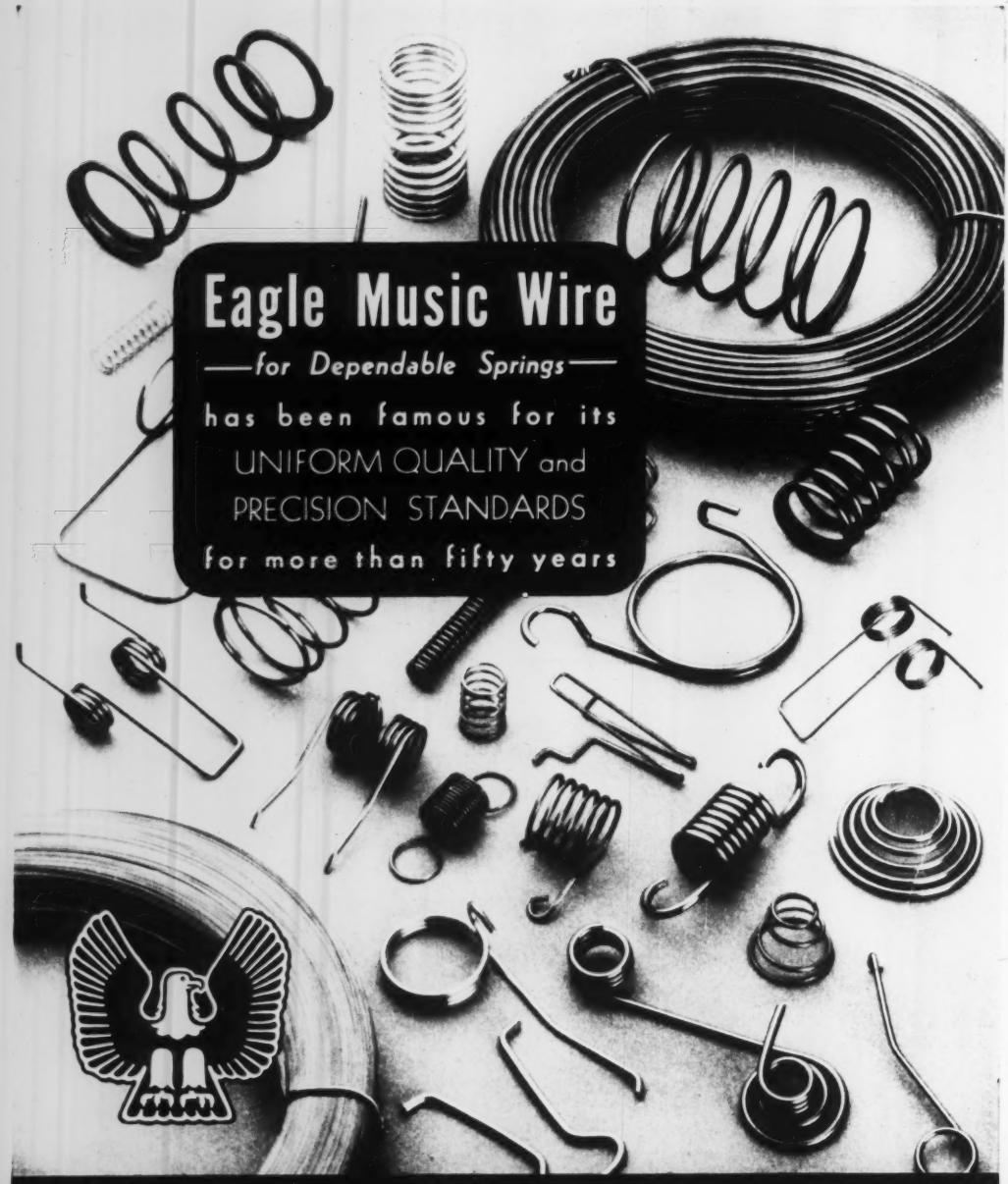
One look up and down Main Street, U.S.A. . . . and you'll see why Metalworking is one of your richest sales prizes. Hardly a square yard is untouched by products made in metalworking plants. Yet this represents but a tiny part of metalworking's vast output that produces over one hundred billion dollars' worth of products annually. This is *your* opportunity. And STEEL helps you seize it. For STEEL enters *more* U.S. metalworking plants than *any* other industrial magazine. Little wonder why more and more men are putting their faith, and their advertising, in STEEL.

STEEL • Penton Building • Cleveland 13, Ohio



Look Closer at only one Main Street item—this parking meter. Consider the operations required in its making . . . operations that call for your products or services. When you advertise in STEEL you reach *more* of the men who direct these operations, and have the power to buy the things you sell.

The magazine of the men who manage, operate, and buy for the metalworking industry



WASHBURN WIRE COMPANY, NEW YORK CITY

CLEAN, UNIFORM BILLETS - STRIP - RECTANGULAR, ROUND, FLAT RODS

TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

3 cost-cutting reasons

for using CRYSTOLON* wheels on gray iron

1. In Norton CRYSTOLON wheels you get an abrasive with just the right hardness and sharpness for fast, economical grinding on a low-tensile-strength material like gray iron.

2. There's a CRYSTOLON wheel that's exactly right for every cleaning room job you do. That goes for everything from swing-grinder work to bench stand — for heavy or light grinding pressure, large or small contact areas, high or low speeds.

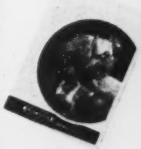
3. You can depend on CRYSTOLON wheels for consistent top performance—thanks to Norton's method of controlling grain spacing that assures uniform structure within wheels and from wheel to wheel.

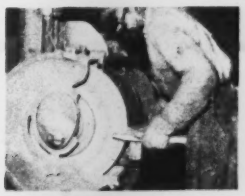
*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

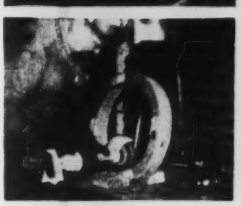
YOUR NORTON DISTRIBUTOR CAN HELP YOU

Besides his own practical experience in grinding applications, your Norton Distributor can always call in a Norton Abrasive Engineer. They will be glad to study your grinding jobs and make recommendations for more efficient, more economical cleaning room operation.

Many Money-Saving Tips on the grinding jobs you're doing right now are contained in this 54-page illustrated booklet. Ask your Norton Distributor for Booklet 1405, or write us direct. NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities. *Export:* Norton Behr-Manning Overseas Inc., Worcester 6, Massachusetts.







NORTON
ABRASIVES
Making better products to make other products better

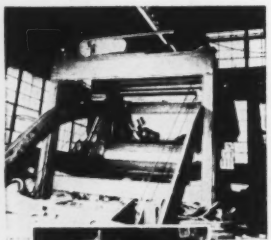
LET RIVERSIDE

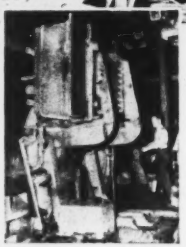
help solve

YOUR CASTING PROBLEMS

Riverside Foundry is ready to give you excellent service on cast armor and all types of QQS 681-B materials. In fact, any steel casting specifications for which your contract might call. We have a full staff of men who have spent years producing ordnance material.

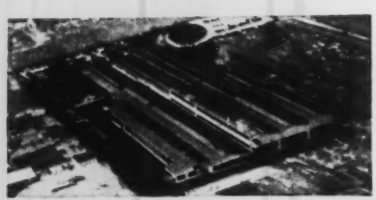
Our customers include many great names of American Industry: Chrysler, American Locomotive, International Harvester, Fisher Body and Ford Motor Company. Ask them about Riverside.



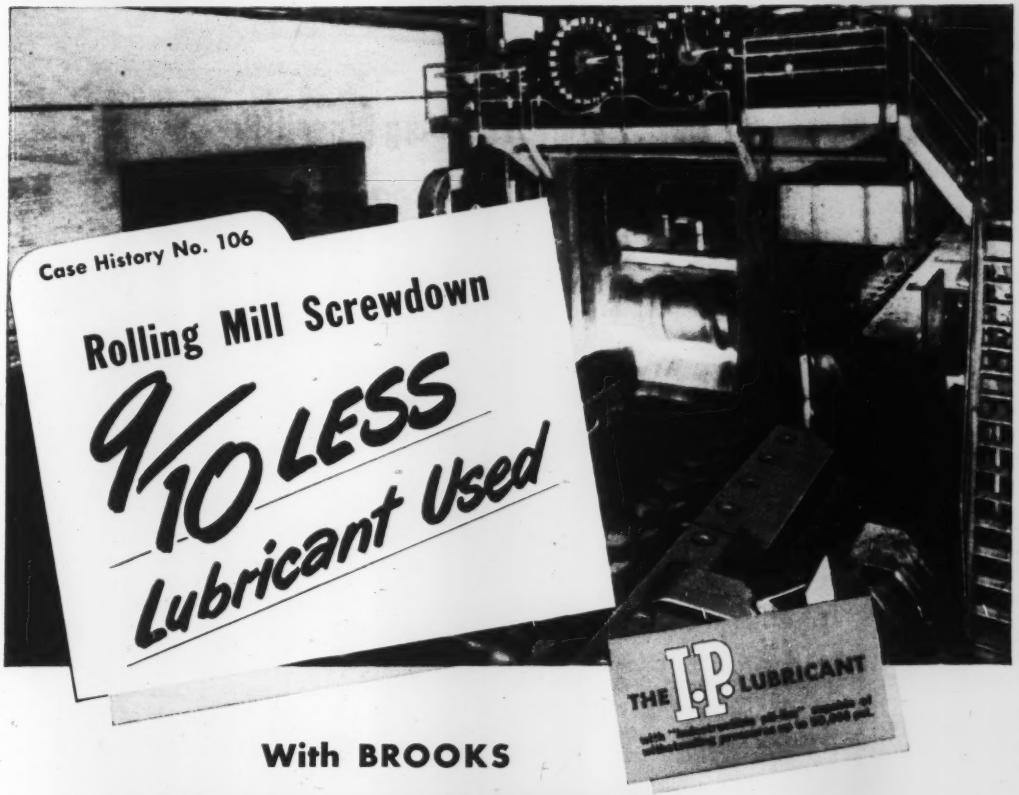


Call or write us at Riverside today.

For a dependable qualified source of steel casting requirements, see Riverside. You give us your drawings. The rest of the job is ours. Save yourself time, worry and loss of production. We are ready to do a complete job for you on any casting requirement.



The big modern Riverside Foundry at Bettendorf, Iowa has the best equipment to do the best job.



With BROOKS

LEADOLENE

On each eight hour shift in a large eastern steel plant 30 gallons of good quality steam cylinder oil were used on each of the two screws of a modern slabbing mill. Then LEADOLENE was thoroughly tested, and the tabulated results showed that only 3 gallons per eight hour shift were used on each screw . . . a savings of 9/10 on lubricant consumption. In addition, operating temperature of the screws was reduced from 210° F to 140° F.

On rolling mill screwdowns, the most difficult of all screws to lubricate, LEADOLENE consistently has reduced lubrication consumption and extended equipment service life. With its "Indestructible pH-ilm," plus high adhesiveness, exceptional temperature characteristics, and low pour point and viscosity, LEADOLENE gives superior service on all types of screws used to move apparatus . . . whether open or enclosed, horizontal, vertical, inclined, high or low speed.

Write for technical data or generous samples for your testing.

With LEADOLENE You Get These Characteristics Essential to Good Screwdown Lubrication

pH-ilm Strength . . . 50,000 psi minimum.

Adhesiveness . . . Affinity for metal develops maximum adhesion and reduces dripping and creeping.

Water Repellence . . . Effectiveness is not reduced by water.

Corrosion Prevention . . . Never acidic and will not etch or corrode.

Compounded Stability . . . Will not bleed or change physical condition within a greater temperature range.

Low Temperature Factors . . . Does not harden, crack or decrease in adhesion.

Abrasive Resistance . . . Repellent to adhesion of scale, metallics and other contamination.

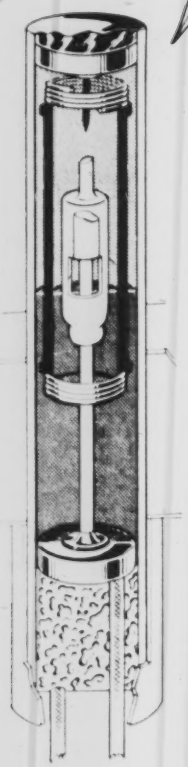
The Brooks Oil Co.

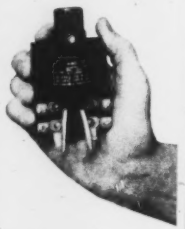
Since 1876

Executive Offices and Plant . . . CLEVELAND, OHIO
Executive Sales Offices . . . . . PITTSBURGH, PA.
Canadian Offices and Plant . . . HAMILTON, ONTARIO
Cuban Office . . . . . SANTIAGO de CUBA

Mercury Relay Stainless Tubing Specifications:

Type 304: Super Finish on ID
OD tolerance ±.003"
ID tolerance +.000"
−.006"





Super finish needed on the inside, to permit ID broaching without so much as a scratch or a pinhole! Tolerances have to be held just right on tube after tube after tube!

Right there you have this manufacturer's reason for specifying *Carpenter* Stainless Tubing over a long period of years.

When you have a Stainless Tubing problem that requires something extra in mill experience and product quality, it will pay you to get in touch with Carpenter. Let us work with your engineers in the development of *your* future products.

Slide Chart on Bending Stainless Tubing gives recommended bending radii and coil diameters for various sizes and gauges. To get good results on bending jobs and avoid waste of critical material, write for your copy.

THE CARPENTER STEEL COMPANY

Alloy Tube Division, Union, N. J.
Export Dept.: The Carpenter Steel Company,
Port Washington, N. Y. — "CARSTEELCO"

Carpenter

STAINLESS TUBING

Analysis · Tolerance · Finish

— guaranteed on every shipment

THE U.S. NEEDS YOUR STEEL SCRAP NOW

ONE-MAN HANDLING

for loads up to 15 tons

Here's the low-cost way to lift, transport, lower and stack heavy materials *anywhere* within an entire bay! One man with a push-button does the entire job with a P&H Trav-Lift without rehandling!

The Trav-Lift is custom built to your requirements. With variable speed full magnetic control, you may have five distinct steps for all motions to meet every need for speed or precision handling.

A number of standard designs enable us to meet your needs at far lower cost when service requirements do not warrant investment in a heavy-duty crane. The Trav-Lift is a product of P&H — America's leading builder of overhead handling equipment.

Handle it "thru-the-air" at lower cost.

P&H OVERHEAD CRANE DIVISION

HARNISCHFEGER CORPORATION

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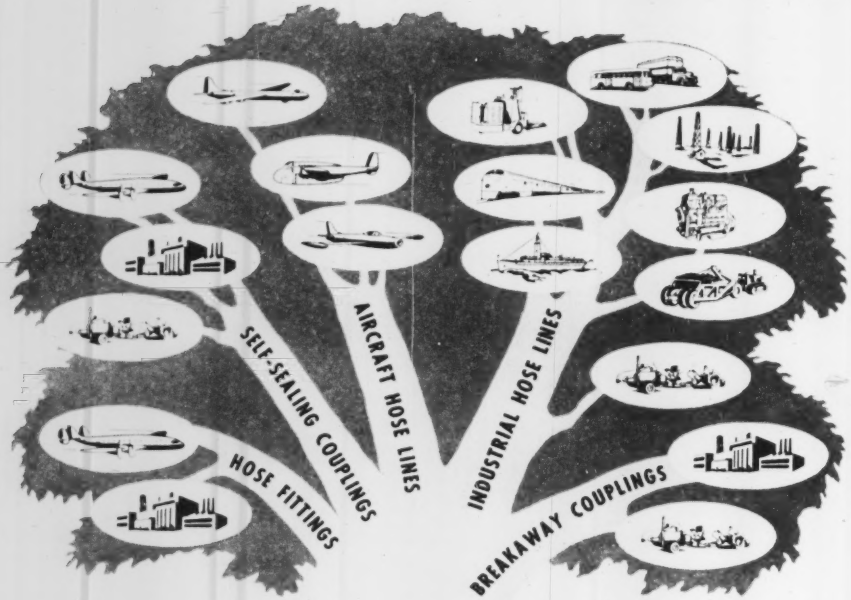
Aeroquip



BRANCHING OUT!

The seed was planted only 12 years ago but the idea grew and grew. Now Aeroquip products serve dozens of major industries with a multitude of applications.

Originally, Aeroquip produced Flexible Hose Lines and Self-Sealing Couplings for military aircraft only. Successive developments, which actually set the pace for military standards, led to Aeroquip's present position of dominance in the fields of commercial as well as military aircraft.

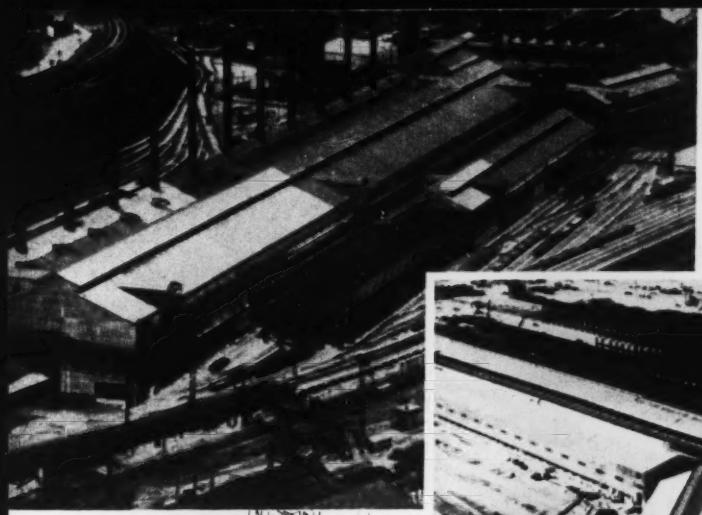
The development of allied industrial products presented vast new opportunities. The "Aeroquip Idea"—bulk hose that can be cut to length and detachable, reusable fittings which can be easily assembled by hand—flourished among manufacturers and users of all types of industrial equipment. Even the farmer is counted among Aeroquip's customers.

Today, Aeroquip produces and sells more hose lines for industrial and aircraft applications than any other manufacturer.

AEROQUIP CORPORATION, JACKSON, MICHIGAN

SALES OFFICES: BURBANK, CALIF. • DAYTON, OHIO • HAGERSTOWN, MD. • HIGH POINT, N. C. • MIAMI SPRINGS, FLA.
MINNEAPOLIS, MINN. • PORTLAND, ORE. • WICHITA, KAN. • TORONTO, CANADA

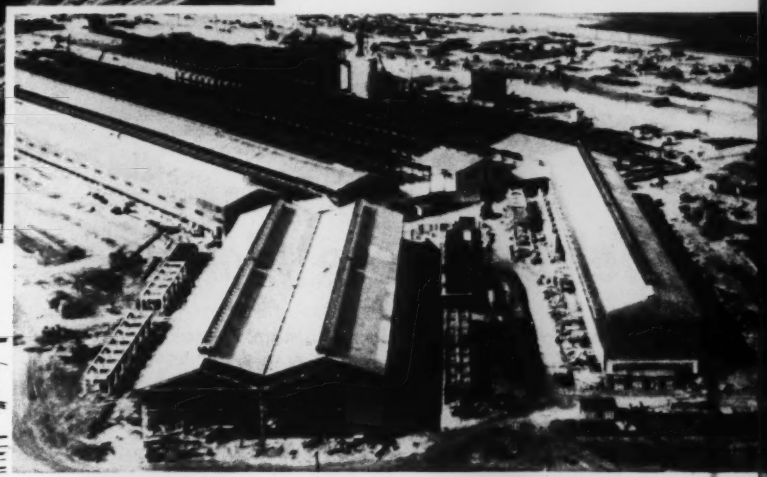
AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

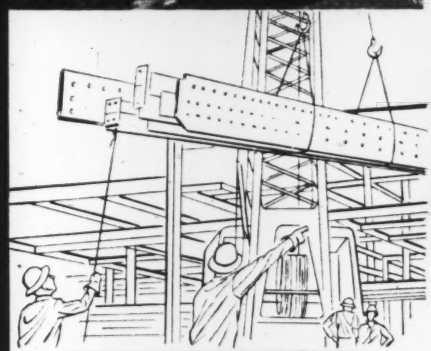


JONES & LAUGHLIN STEEL CORPORATION'S multi-million dollar expansion project on Pittsburgh's South Side.

• • •

REYNOLDS METALS COMPANY, San Patricio Plant, Corpus Christi, Texas, for increased production of aluminum.





AMERICAN BRIDGE

lends a helping hand

as nation's essential industries continue to expand!

LESS spectacular than city skyscrapers, but just as important to our nation's defense and economic growth, are the unheralded industrial buildings which have been built or are now under construction all over this great country of ours.

Of the thousands of such steel-frame structures built by American Bridge, we are perhaps proudest of those we have done, or are now working on, for vital industries. Included in this group are many important metal producers.

To be selected by these leading steel and aluminum producers is a splendid tribute to the engineering, fabricating and erecting know-how of the American Bridge organization.

It is also your assurance that American Bridge has the fabricating facilities, erecting equipment and skilled personnel to handle any type of steel-frame construction with exacting precision, thoroughness and speed . . . any time, anywhere.

If you would like to know more about the advantages of American Bridge fabricated and erected steel construction, call our nearest office.

Major Industrial Buildings for Metals Production Recently Fabricated and Erected by AMERICAN BRIDGE

- **ALUMINUM COMPANY OF AMERICA**
  Point Comfort, Texas
- **JONES & LAUGHLIN STEEL CORPORATION**
  Pittsburgh, Pa.
- **LONE STAR STEEL COMPANY**
  Daingerfield, Texas
- **REPUBLIC STEEL CORPORATION**
  Cleveland, Ohio
- **UNITED STATES STEEL COMPANY**
  Fairless Works
  Morrisville, Pa.

AMERICAN BRIDGE DIVISION, UNITED STATES STEEL COMPANY
GENERAL OFFICES: 525 WILLIAM PENN PLACE, PITTSBURGH, PA.

Contracting Offices in: AMBRIDGE · ATLANTA · BALTIMORE · BIRMINGHAM · BOSTON · CHICAGO · CINCINNATI · CLEVELAND · DALLAS · DENVER · DETROIT · DULUTH · ELMIRA · GARY · MEMPHIS · MINNEAPOLIS · NEW YORK · PHILADELPHIA · PITTSBURGH · PORTLAND, ORE. · ROANOKE · ST. LOUIS · SAN FRANCISCO · TRENTON

UNITED STATES STEEL EXPORT COMPANY, NEW YORK

AMERICAN BRIDGE

USS

UNITED STATES STEEL

Weirton chose Monel...

Monel scrubber section of new Weirton No. 4 Electrolytic Tin-Plating Line. Monel was chosen because of its high resistance to hot pickling acids. Photos courtesy of the Weirton Steel Co., Weirton, W. Va.

Scrubber tanks of Monel help keep maintenance costs low in Weirton Steel Company's new electrolytic tin-plating line

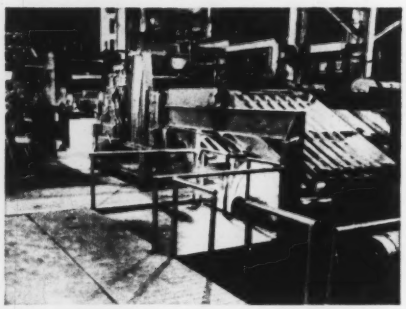
Capable of a continuous coating speed of 2500 feet per minute, the Weirton Steel Company's new No. 4 Electrolytic Tin-Plating Line is said to be the largest and fastest in industry.

The rated capacity of the new line is 5,000,000 base boxes per year, raising the Weirton Tin Mill production potential to 15,000,000 base boxes annually.

Pickling tanks in the line are 100 feet long ... oversize because of the high speed of the strip passing through. The scrubber section, where the steel sheet is washed with hot water to remove carried-over pickling acid, is made of Monel®. Monel was chosen for this application because of its excellent resistance to hot pickling acids ... an essential quality for low maintenance costs.

Equipment for the new line was manufactured by the Wean Engineering Company of Warren, Ohio, and the Westinghouse Electric Corporation of Pittsburgh, Pennsylvania. The line was designed by the Weirton Steel Company's own engineering department.

If you — like the Weirton Steel Company — have metal problems involving corrosion or high temperatures, remember that INCO's Technical Service Department is always ready to help you solve them.



End of Weirton high speed electrolytic tin-plating line, showing finished tin plate being coiled. The line is the largest and fastest of its kind, making the Weirton, West Virginia, plant the world's largest tin mill.

MONEL ...FOR MINIMUM MAINTENANCE

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INCO

The Metalworking Outlook

December 15, 1952

Materials: Midyear Paradox?

The main reason why General Motors' C. E. Wilson was designated secretary of defense was to correct the $22 billion lag in military spending for hard goods and construction (p. 75). If Mr. Wilson's wizardry at General Motors works in the Pentagon, too, his success could result in a paradoxical situation. He may so speed up defense output that materials scarcities could again become more severe—along about next summer. A marked tightening in materials' supply is still only a remote possibility, but it's something to keep in mind.

Steel Looks Good

For the short term, at least, the outlook in steel looks good. An estimated 23 million tons of finished will be available for all users in the second quarter of 1953, compared with better than 21 million tons in the first quarter. No substantial supplemental allotments will be available for January, February and March. That will be a blow to automakers who are looking for some, but they have won a point by getting federal approval to build 1.5 million cars in the second quarter, although materials aren't guaranteed for that many units. In the first period they are permitted to turn out 1,250,000 cars.

Problems in Aluminum, Copper

The immediate prospects for aluminum are not so promising. Shipments this quarter will reach only about 700 million pounds because of the power shortage and won't do much better if power problems continue next January and February. If those difficulties clear up promptly, some 739 million pounds could be available to users in the first quarter, 742 million pounds in the second quarter, 757 million pounds in the third and 781 million in the fourth. Copper supplies should hold fairly steady from now until 1954 or 1955, at a little more than 1.5 million pounds a quarter.

Towards a Natural Death

The mockery of wage and price controls will continue until the new administration. The new administration probably will let them ride along as they are now, since they can be decently buried Apr. 30, anyhow, when the congressional authority for them runs out. Total metalworking inventories of materials, supplies and work in process have been rising steadily since a midyear low, but by yearend they'll probably still be below what they were at the end of 1951. At that time they totaled $13.6 billion. If they do fall, a rising trend going on since 1949 will be reversed.

The Last Jet Interceptor?

A good bet: That the U. S. Air Force contract given Consolidated Vultee Aircraft Corp. for production of a delta-wing jet interceptor, the F-102, will be the last such contract for fighter planes of that type. Then comes guided missiles. J. H. Kindelberger, board chairman of

Production Engineering News—p. 103 *The Market Outlook—p. 177*

North American Aviation Inc., predicts that the intercontinental guided missile is "just over the horizon." It will be capable of "accurately delivering to any point on the surface of the earth in a few hours a warhead carrying infinite destruction." Because of speed and altitude, he says, guided missiles are impossible to intercept. Some estimates have placed full production of guided missiles not more than two or three years away.

Somber Note

Here's another somber note: Post-attack industrial rehabilitation plans are proceeding seriously. Stanford Research Institute, under a National Security Resources Board contract, is now conducting a pilot study in the San Francisco Bay area to make an estimate of what an attack would do to industry, utilities and community functions. It expects to come up with a report by Dec. 31.

New Structural Member

Penn Metal Co. Inc., New York, has developed steel structural sections which can be used in the light building field—housing, schools and industrial or commercial buildings up to three stories high (p. 79). The sections are fabricated from strip steel by cold rolling. To be fabricated at Penn Metal's Parkersburg, W. Va., plant, the structural members are competitive pricewise with other good types of sections.

Straws in the Wind

Crucible Steel Co. of America's new 1000-tons-a-day blast furnace is now operating at Midland, Pa. . . . "Very large tonnages" of medium and lower-grade iron ores have been found in northern Quebec which will probably be destined for European steelmaking centers . . . The newly formed Hydrocoal Corp. will build a 35-mile pipeline from East Liverpool, O. to Youngstown to pipe coal as they might fuel oil . . . Cash dividend payments by corporations issuing public reports amounted to $249 million in November, up 2 per cent from the $243 million payed out in November, 1951 . . . Railroads hauled 52,288,000 tons of iron ore to upper lake ports between Aug. 3 and Nov. 29, an alltime record.

What Industry Is Doing

The steel industry is becoming disturbed at what it considers the unreasonable steel demands made by Petroleum Administration for Defense (p. 76) . . . Industry takes a look at the holiday season (p. 77) . . . Construction volume may exceed $33 billion for an alltime record in 1953 (p. 78) . . . Japan will help finance a new steel plant in India (p. 80) . . . Colorado Fuel & Iron Corp. continues its move eastward with acquisition of John Roebling's Sons Co. (p. 80) . . . Makers of automotive replacement parts expect a $2.5 billion business in 1953 (p. 85) . . . Belgium expects more efficient steel output and France looks to steady steel prices as means to solve their export problems (p. 86).

An Urgent Call for Action

PROGRESS DEMANDS:

Immediate Replacement of a Dangerous, Obsolete Tax Law Provision

THE CASE: The normal, healthy growth of America's industrial strength is being seriously hampered, and its military security threatened, by a depression-born tax provision of the U. S. Bureau of Internal Revenue. This obsolete provision retards plant modernization by encouraging the retention rather than the replacement of obsolete productive equipment. Both obsolete machine tools *and* obsolete laws must be replaced.

This damaging provision, (Bulletin "F" of the BIR—a 1942 revision of Regulation TD-4422), arbitrarily established the useful economic life of a majority of new machines at 15 to 30 years. Inequitable from the start, it has become increasingly unfair, because the rapidity of continuing technological advances now renders most machine tools obsolete, on the average, every 7 years.

Bulletin "F" continues to flout reality by forcing industry to adhere to an extended period of tax write-offs on new equipment, based on the arbitrary 15 to 30 years life span estimate. This long-term—but short-sighted—depreciation policy means that a replacement and modernization program is, for all companies, extremely difficult, and, for many, economically impossible.

An Example

Let's take a look at the grim results of the existing regulation:—

In 1949, over 43 per cent of the machine tools in use in this country were ten years old or older . . . and at least 95 per cent were more than 10 years old in design.

Consider the fact that a new machine today costs more than twice as much as a comparable machine, vintage 1934, and may become obsolete *twice as fast*.

What does this mean to the manufacturer? Take the case of a company owning a machine tool for which it paid $5,000 in 1942. Let us assume the machine has a 20-year life, according to the present tax schedules. Thus, by 1952, the company would have recovered $2,500 of its original investment in the machine. It wants to replace that machine with new, high-speed equipment—but replacement costs $10,000.

If it is the company's policy to finance new equipment out of current earnings, it must earn approximately $15,000 under a Federal income tax rate of 50% (disregarding the Excess Profits Tax) to provide the additional $7,500 for the new machine—yet it can recover the $10,000 invested in the new machine only at the rate of $500 a year! For most companies, such a financial burden can be unbearable.

Penny-wise, Pound-foolish

TD-4422 was a depression expedient to increase tax revenue by about $94,000,000 a year. In terms of short-range tax collections it has *seemed* to be profitable. Yet the tax collections on the increased *earnings* that would result from a more far-sighted tax regulation unquestionably would far outweigh the present revenues.

While this additional tax revenue on increased productivity is being lost, our industrial strength, too, is being sapped by these depreciation rates—the poorest of any major industrial nation. We are senselessly stunting our economic growth and weakening our national security by lowering plant efficiency in thousands of small and medium-size companies.

Small and medium-size producers are the sub-contractors of big industry, and comprise the backbone of our industrial economy.

Ironically, our government fully appreciates the fact that accelerated tax write-offs stimulate and quicken plant modernization, and increase production.

Proof is the fact that the government has granted many firms the privilege of 5-year amortization of capital equipment (under Certificates of Necessity). This was done to provide an incentive to purchase new high-speed machine tools, thereby gaining the added production urgently needed for defense.

How sensible and how logical it would be if government offered a similar incentive to *all* industry—without resorting to such devices as "Certificates of Necessity"!

The reduction in tax revenue resulting from discretionary write-offs would be negligible—while the potential *gain* in new revenue and industrial strength would be tremendous.

The Remedy

An immediate amendment to the Internal Revenue Code, enabling each individual manufacturer to write off his investments in equipment at whatever rate he may elect.

This urgent need transcends party lines.

P.S. Reprints of this page are available.

BIBLIOGRAPHY: May, '52, *Capital Goods Review*, *MAPI*; *McDonald Statement to Senate Subcommittee*, *Technological Stagnation in Great Britain*, *MAPI*; *The Iron Age*, July 3, '52, pg. 113—also *The Iron Age*, May 15, '52, pg. 98.

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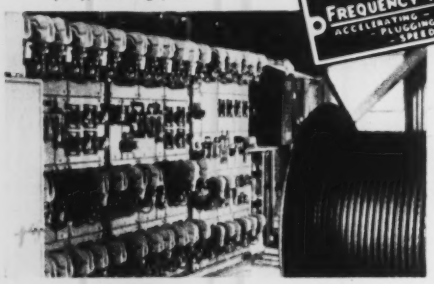

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Right and Proper

Perhaps a lesson can be learned from the attitude of leaders of the outgoing administration toward the incoming President and members of his cabinet. Mr. Truman and some of his associates have been exceedingly gracious in co-operating with the officials-elect. For this they deserve due credit. At the same time, they do not hesitate to create the impression that "poor Ike" is appalled, if not overwhelmed, by the immensity of the task he has undertaken.

One finds this feeling reflected not only in the statements of Washington officialdom but also in the writings of newspapermen and columnists who had become partial to the political regimes of the past 20 years. In their opinion, Ike's visit to Korea was futile. "What can he do that hasn't already been done?" To them, efforts to reduce government expenditures will be a waste of time. To their minds, no improvement in foreign policy seems possible. Restoring the buying power of the American dollar to something near normal is to them a possibility so remote that they do not even mention it.

In these efforts to promote the idea that Ike is no miracle man, the Trumanites overlook one important factor. If they ever knew it, they have forgotten that inspired leadership can perform wonders. Mediocre or lack of leadership since 1945 has created a situation in the United States where frustration and fear have almost replaced faith and hope as the motivating spirits in men's minds.

The propaganda possibilities of our system of individual freedom are unlimited, but under recent government mishandling they have not been pushed intelligently or aggressively. If we were to go all out on the merits of individual freedom, we could defeat the ideology of the communists hands down.

This is our major problem today. It is up to us to translate our ideas about the dignity of the individual into terms that people in less fortunate nations can understand. Ours is a job of raising moral considerations to a higher level.

"Moral" means that which is "right and proper." With intelligent leadership a higher moral consciousness can lead this troubled world to sanity.

E. C. Shaner

EDITOR-IN-CHIEF

CONSTRUCTION IN 1953: When asked to comment upon the outlook for construction activity in 1953, a representative contractor replied: "When business slacks off about this time of the year we look back and say 'Well, we've had a very good year, but next year couldn't be that good.' We've been saying that for the last five years and have

been wrong each time." He and most other experts expect a good volume of construction next year. It could exceed $33 billion (pp. 78, 79), which would be a record.

This impressive total is envisioned in spite of an expected reduction in industrial, private home and public housing construction and in federal irrigation projects. Little change is anticipated in building for communications, railroads, inland waterways, petroleum refining, churches, hospitals and farms. Gains are forecast for commercial structures such as apartments, stores and office buildings; social and recreational buildings; state, federal and toll highways; sewers and water systems; pipelines for oil and gas; electric and natural gas public utilities; military installations; and atomic energy projects.

Gratifying is the indication that the ratio of privately financed to publicly financed work will be higher than in 1952.

* * *

ONLY 5 CARGOES SHORT: Last spring Great Lakes iron ore carriers figured out a goal of 96 million tons for the 1952 navigation season. Shipments in 1951 had been 89,092,012 tons. Everything went well until the steel strike occurred. The vessels were idle 55 days, during which time shipments of about 24 million tons were lost.

At the end of the strike, the carriers revised their season's goal from 96 to 75 million tons. Early last week when the *Benson Ford* brought down the last cargo of the season, the Lake Superior Iron Ore Association reported that total movement for the year was 74,910,798 tons (p. 194). Considering all circumstances, this is an excellent record. It is barely five cargoes short of the revised goal of 75 million tons. Also, had the strike not occurred, the lake fleet could have exceeded its original goal by almost 3 million tons.

* * *

AEC SCRAP IS NOT HOT: While representatives of the steel industry, scrap dealers and the government differ somewhat in their opinions as to whether the present mill stockpile of 6.8 million net tons of scrap will be adequate (p. 76), a reassuring report comes from the Atomic Energy Commission to the effect that scrap steel contaminated with natural uranium, released by AEC into commercial scrap channels, presents neither health nor technical hazards.

Exhaustive tests conducted by AEC on steel produced with scrap removed from uranium production plants (p. 138) showed that the average uranium concentration was less than 10 times that in steel produced with normal scrap. Also it was found that most of the uranium contaminant was removed from the steel with the slag. There would be further dilution in average steelworks practice. Apparently one need not fear that scrap steel from AEC plants is "hot."

* * *

GOOD LESSON FOR NATO: William L. Batt, former American industrialist who is retiring now as U. S. minister for economic affairs to the United Kingdom, points to a serious impediment to the rearmament effort of the North Atlantic Treaty Organization. It is lack of standardization in making engineering drawings and blueprints among NATO nations. He says that the necessity of redrawing American, British and Canadian blueprints to fit the shop practices of individual countries (p. 149) is resulting in costly production delays.

He discloses, in contrast, that engineering standards received from Czechoslovakia indicate that the Soviet Union has developed a system of drawings and nomenclature that is in uniform use throughout Russia and her seven European satellites. This makes it look as if the NATO nations have permitted the Communists to steal a march on them. Today national standards are not enough. More and more we will find it desirable to develop international standards.

* * *

OVERDUE FOR OVERHAUL: National Planning Association is presenting a plan for reorganizing the office of the President of the United States. The plan, which is the joint work of a dozen or more men of widely recognized competence (p. 82), would replace the present cumbersome array of staff aids and overlapping operating bureaus with a very few, well co-ordinated units. In many ways the suggested organization is based upon ideas which have proved effective in the management of some of the most successful large American business corporations.

Undoubtedly this plan, the bi-partisan Hoover reports and other suggestions for streamlining the executive branch of government will be considered carefully by the incoming administration. Here is a field in which the opportunities for marked improvement are almost unlimited.

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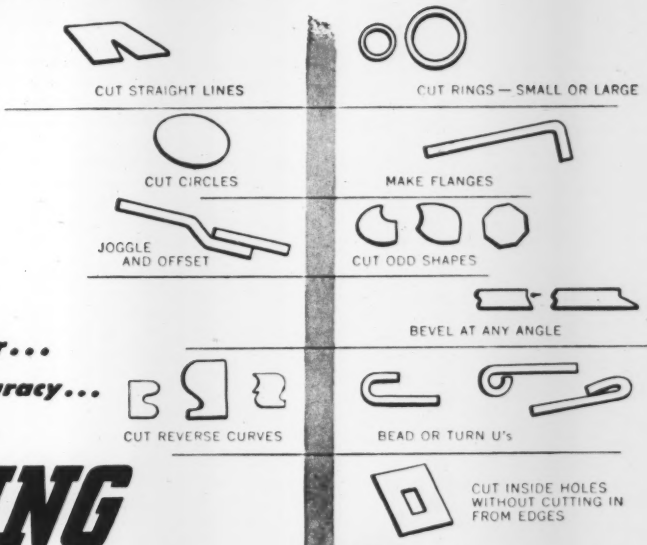

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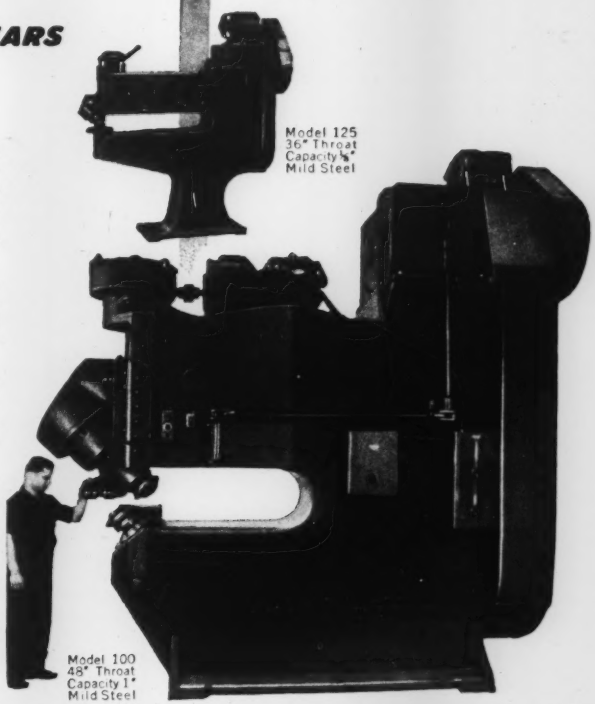

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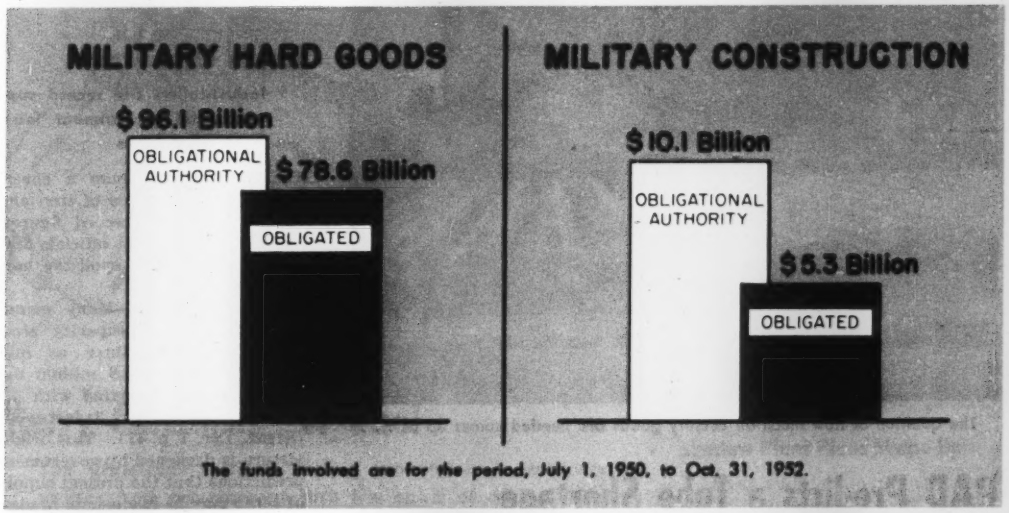


Military Spending: A Step Behind

War output lags, as measured by the gap between Defense Department's obligational authority and money actually obligated. C. E. Wilson's main job: To find a balance

NEW DEFENSE Secretary Charles E. Wilson's major job will be to balance military spending and production with the funds available for the mobilization effort.

That's out of balance now, as the figures charted above indicate. From the start of the Korean War through Oct. 31, 1952, Congress granted the Defense Department $117.6 billion in obligational authority for procurement and construction—the bulk of it for construction and hard goods as shown above and the $11.4 billion remainder for soft goods. Of that total, only $93.5 billion has been obligated—$83.9 billion for hard goods and construction and $9.6 billion for soft goods.

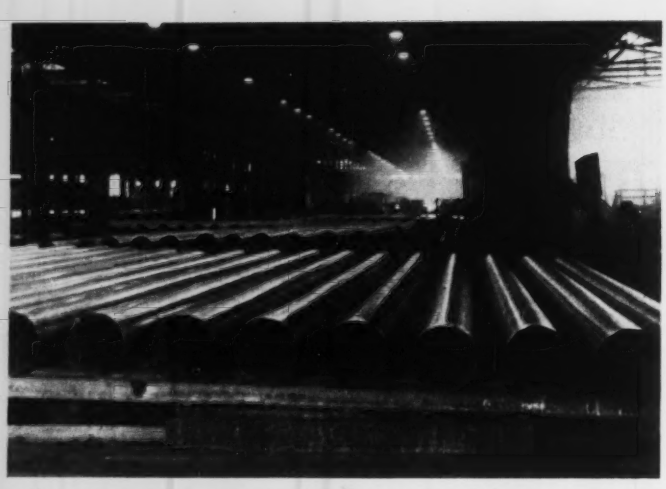
What It Means—As it looks now, most of the funds unobligated now will eventually be spent, once military men decide what they want. But in the meantime the effect on industry is: Wasted efforts as production programs are changed and an inability to make firm plans for the future, including uncertainty about prospects for materials.

What the slippage amounts to in the Air Force is this: After the stretchout the production peak for airplanes was set for this month, at which time production was expected to reach 800 units. Now the peak can't be expected until next May at the earliest — and probably not before next fall.

Explanation — The reason for these shifting goals is largely that military men keep changing their minds, usually because of the rapid metamorphosis of war. An example is the tank program. The Army will cut back production of medium tanks to 55 per cent of the numbers originally scheduled for early 1954. It has decided the medium units no longer do a job, so production of M-47 mediums will be halted completely by the end of 1953. Production of the later model M-48 will continue at reduced rates. The new schedule goes into effect next July 1 and will mean that three of the five plants now manufacturing medium tanks will close down when their contracts expire. American Locomotive Co.'s facility at Schenectady, N. Y., Ford Motor Co.'s plant at Livonia, Mich., and the government-owned Detroit Tank Arsenal operated by Chrysler Corp. Plans are also in the works to cut production of light tanks and 2½-ton trucks.

What's Involved—No final decision on what to do about the lag will come up quickly. To decide, President-Elect Eisenhower, Mr. Wilson and their associates will have to decide what route the Korean War and international events will take, whether we should have quality or quantity in our military production and many other matters.

Some of the groundwork necessary to arrive at good decisions is being laid now. The Eisenhower cabinet meeting in the Pacific is one step. Mr. Wilson was there primarily to get background for a decision on production, which will largely be his to make. He is already planning the monumental job of reviewing existing military inventories. It all takes time, but you can expect a firm military production policy by about mid-1953.



The question of how much oil country goods are needed comes up as . . .

PAD Predicts a Tube Shortage

Statistics fly back and forth as PAD's Product Division Director R. L. Foree charges steel mills aren't turning out enough oil country goods to avert a shortage

PETROLEUM ADMINISTRATION for Defense's R. L. Foree "got something off his chest" in Albuquerque, N. Mex., early this month. He claimed the steel mills in this country are not now producing and are not planning to produce in the next few years enough casing and tubing to meet the prospective needs of the country's oil industry.

Citing figures of the American Iron & Steel Institute and the Census Bureau, Mr. Foree estimated a deficit in regular mill production of casing and tubing under actual usage in 1951 of 420,000 tons. The discrepancy would be 966,000 tons in 1952 he figured.

Long-Term Expedients—"Every one of the five methods that oil and gas operators have used to stretch the short supply of new oil country tubular goods has been an expedient," sums up Mr. Foree. "Neither the operators nor the country can rely upon these emergency methods much longer."

After hearing the comments of the PAD Product Division chief, John E. Timberlake, chief of the NPA Iron & Steel Division, said: "The investment in new oil country tubular plants, involving millions of dollars, is certainly the answer of the steel industry to the question of continued interest in tubular goods production.

Percentagewise — "The percentage of increase in new capacity for oil country tubular goods substantially exceeded the percentage of increase in ingot capacity."

Mr. Timberlake denied a later statement by Mr. Foree that all oil country facilities were operating at 20 to 21 turns a week (that would mean 3 turns a day, 7 days a week). Mr. Timberlake explained that the reason for reduced production was a lack of ingot capacity to support all finishing operations at full capacity. New ingot capacity comes in starting Feb. 15, 1953, and gradually throughout the balance of 1953.

American Iron & Steel Institute statistics show that oil country goods have not lost out percentagewise in the increase of steel product shipments. In fact, they took 2.3 per cent of 1949's 58,104,010 tons of steel product shipments and 2.36 per cent of 1952's estimated 68,469,900 tons of steel product shipments.

Scuffle Over Scrap

Industrialists cite record supplies, but government fears a spring famine

STEEL producers hum a cheerful tune as stockpiles of iron and steel scrap reach record figures, but some government officials fear a long winter could spoil the harmony.

Peak Production—Many manufacturers forecast capacity steel production this winter as mill yards bulge with 6.8 million net tons of scrap, compared with 4.4 million tons on Dec. 1 last year (STEEL, Dec. 1, p. 47). This bright picture is darkened by government predictions that the present supply of scrap may be inadequate in view of the high production rate expected in 1953.

A critical scrap shortage last year was met by a concerted campaign on the part of government and industry. Now there is no such unanimity as to the need for another drive. Government planners suspect that earlier scrap campaigns have cleaned out most of the obsolete industrial scrap available. They say "production scrap" and "railroad scrap" are the only types coming in steadily, while dealers' collections are off from 15 to 25 per cent.

Government Worries — Factors causing the government to challenge some optimistic industrial forecasts are: Fears that the shipment of war material out of the country in the 1940's reduced potential domestic supply; much of the year's increase in inventories resulted from the steel strike, during which scrap accumulated; and higher steel output in 1953 will cut into those supplies and require new highs in scrap stock.

Government officials predict a demand for 36 million net tons of purchased scrap in 1953. Some of the more optimistic industrialists point out that we generated 37.9 million tons of purchased scrap in 1951, although the scrap drive was at its height that year. In 1952, about 33.5 million tons of purchased scrap will be consumed.

Merry Christmas—or Else!

The Christmas spirit is fading monetarily in industry as unions and government turn the spirit of giving into the spirit of grabbing. Management must avoid precedent

AS THE SEASONAL jingle of bonus money grows fainter each year, many unions are hard at work convincing employees that management is a Scrooge and not a Santa Claus.

But unions are doing their part to curdle Santa's eggnog. They don't want bonuses to appear a gift from management at all; rather a benefit won by the union for its members. Then, too, Santa got his fingers burned at the NLRB fireplace on bonus payments. That body ruled that bonuses withheld from employees deemed unsatisfactory is an unfair labor practice and that if a bonus were delivered over a number of Christmases the employees had a right to dump Santa's bag and help themselves to a like amount even if Santa's bag were nearly empty.

Bah! Humbug!—Finally Santa banged his head on a WSB ruling that a bonus of over $40 exceeds the true spirit of Christmas and must be approved as a part of wages. This philosophy has left many once-filled stockings with a mere $40 lump in the toe.

Only about 47 per cent of firms surveyed still pay bonuses, reports Associated Industries of Cleveland. About 90 per cent of these firms are smaller companies who offer bonuses to make up for the fringe benefits they can't afford and to further the more intimate relationship they have with their employees. Bonuses run about $25 to $50 on the average.

"No L" Parties—The real forte of Christmas in industry is the avowedly liquorless office party, tolerated or sponsored by management.

The liquor problem is being relieved in many cases by the increasingly popular family or children's party. Frequently refreshments are offered and Santa arrives spectacularly to distribute appropriate gifts to all (value about $12 per worker), listen to last minute requests and put managements' best foot forward.

Groceries—About 36 per cent of industry gives gifts other than money to its employees, usually of the candy, fruit or turkey variety selected arbitrarily by management. About 60 per cent of management also gives gifts to its customers, but 30 per cent discourages gifts to its own personnel, particularly purchasing agents, feeling that such gifts may entail future promise rather than past fellowship.

But cheer up. Those suppliers who customarily send a basket of grapefruit or a box of cheese will probably continue to do so despite pleas to the contrary—they just can't be sure their competitors will heed them. In fact, the outlook is for more and better gifts this year than ever before as the buyers' market begins to amplify the Christmas spirit.

Home for Christmas?—Chances are about two to one if you're a metalworking employee you'll get not only Christmas and New Year's Days off, but also the three-day weekend following each as well. The only catch is that you'll probably get the added days without pay despite current UAW agitation at Chrysler Corp. for pay on the 26th and 2nd.

Industry is finding some of the "merry" taken out of "Merry Christmas" as a result of union pressures and government rulings.

Shadow Plant Plans Shape Up

Latest addition to the so-called shadow plant program is a possible string of plants for production of heavy forgings for the Navy.

Shadow plant program now envisions a possible total of as many as 50 establishments to be erected by private firms fitted out with government-owned equipment and held in standby as part of the mobilization base for operation in case of full war emergency. Included so far are plants to produce tanks, steel foundries to produce cast steel, tank and other armor, possibly five jet engine plants, ten or more plants to produce machine tools, components and gages and some ammunition plants.

Fear Electronics Recession

Large-scale radio communication equipment makers fear small business electronics subcontractors may not be able to weather a stand-by period after completion of emergency defense contracts. Failure of such firms would hurt the defense potential.

NPA believes the high point of military electronics equipment production may be reached in the second or third quarter of 1953. In September of this year, estimated value of deliveries of military electronics and communications equipment was twice that of September, 1951, and 8.4 times the average of the third quarter, 1950.

STEEL

$33 Billion Collossus

1953 outlook involves these changes from 1952

UP...

- Commercial (apartments, stores, office buildings)
- Social, Recreational
- Highways (state, federal, toll roads)
- Sewers, Water Systems
- Pipelines (gas, oil)
- Utilities (electric, natural gas)
- Military Installations
- Atomic Energy Plants

LITTLE CHANGE

- Communications
- Railroads
- Inland Waterways (Army Engineers — rivers, harbors, dams)
- Petroleum Refining
- Churches, Hospitals
- Farm Building

DOWN...

- Industrial (or manufacturing)
- Private Homebuilding
- Public Housing
- Federal Dams, Irrigation Projects

EVEN BUILDERS are beginning to admit it: 1953 will be a whopping big year for construction.

This behemoth industry accounting for ten per cent of our gross national product generally prefers post-mortems to predictions, but this year the limb looks sturdy enough to climb out on. Focusing on 1953, construction men see total building that promises to surpass this year's stratospheric level by one billion dollars. Despite fluctuations in its makeup, the total construction bubble will swell to about $33.3 billion next year — an all-time high in a supercharged economy.

Boiled Down—Reduced to essentials, here's why construction will be so good: People will have the *opportunity*, the *wherewithal* and the *incentive* to build. The first two will result from construction materials swinging sharply into balance as fortified productive capacity catches up with mobilization needs. As more materials become available, control walls will crumble, loosing these materials for less-essential projects.

Already NPA has acceded to industry demands and beginning Jan. 1 will allow builders of commercial, entertainment and apartment projects to write substantially higher tickets for steel and copper though quotas won't be as high as builders would like them.

Incentive will be present because of a general business buoyancy and a confident business attitude resulting from a change in administrations. Faith in the future is a good spur for capital investment.

Framework—Key to next year's building is structural steel, skeleton of construction. Shipments are at a rate of 2.7 million tons for 1952, promise to go much higher in a strikeless 1953. Structural fabricators today have enough business booked to last them nearly a year much of which could be paper tonnage though.

The structural industry doesn't believe the backlog means too much, because if controls came off fast or jobs were released faster, backlog could be cut down rapidly and would go into the production end. Little of this backlog is government work. The true supply picture is distorted because the military's eyes are bigger than its stomach: A goodly portion of set-aside tonnage is turned back regularly. Warehouses today find little trouble in filling structural orders for small and medium-size jobs.

Shape Evolves—An altered pattern of use of construction materials will emerge in 1953 — one showing greater representation of strictly civilian work. Industrial construction is past its peak and ebbing gradually, though not nearly so fast as was expected a year ago. Plant building in 1953 will be at about a 25 per cent reduced rate of $1.7 billion. Most of this will be long term rather than defense-inspired projects.

On the downgrade will be basic industries first expanded after Korea, including steel, machinery, chemicals and transportation equipment. Emphasis will shift to industries using this expanded output or held down by necessity, such as electric power and electrical machinery and oil.

Overcompensating — More than making up for this sag will be pent-up demand for community and commercial building, highways and utilities, as well as further addi-

CONSTRUCTION QUOTES

RAYMOND M. FOLEY, *housing & home finance administrator*—
"There will be an effective market to absorb 1 million homes next year and for some years thereafter. Costs of completed houses will probably decline somewhat in 1953."

LYLE S. GARLOCK, *assistant controller, Defense Department*—
"Assuming no new appropriations at all forthcoming, 1953 will see as much as a 50 per cent higher gross in new construction of Defense Department installations, excluding atomic energy and Korean requirements; 1954 will be even higher."

RALPH S. TRIGG, *acting defense production administrator*—
"Backlog of future work (defense work requiring CMP materials) is not stacked up nearly as much as it is in the minds of claimant agencies. A lot of the scarcity exists because of the clamor set up by needy users."

H. C. TURNER JR., *president, Turner Construction Co.*—
"Competition among contractors for jobs will become even keener in '53."

L. ABBETT POST, *executive vice president, American Institute of Steel Construction*—
"It looks good to me. I believe that with a realistic approach to controls by NPA, the construction industry and fabricators stand to be quite busy in 1953."

THOMAS S. HOLDEN, *president, F. W. Dodge Corp.*—
"In construction, we see only minor changes from the 1952 pattern of activity . . . While there may be some decline in new plant and equipment expenditures, it need not be of significant size or long duration."

WILLIAM BALDERSTON, *president, Philco Corp.*—
"Ten million homes will be replaced or modernized in the next decade."

J. L. ERWIN, *vice president, H. K. Ferguson Co.*—
"When business slacks off about this time of year we look back and say, 'Well, we had a very good year—next year couldn't be that good.' We've been saying that for the last five years and have been wrong each time."

tions to military installations and atomic energy plants. Defense building will stay surprisingly strong for such heavy work as air bases, radar networks and naval facilities, rather than for light or repair installations.

In 28 months after the start of the Korean War (through Oct. 31, 1952), $10.1 billion was appropriated for military building (see p. 75 for more details). Going into November of this year, there was still $4.8 billion of that left to be obligated. Estimated expenditures in fiscal 1953 are calculated at $2.4 billion, with a further rise slated for 1954 whether new funds are appropriated or not. Atomic energy plants, such as the gargantuan Ohio project, will weigh heavily in construction dollars.

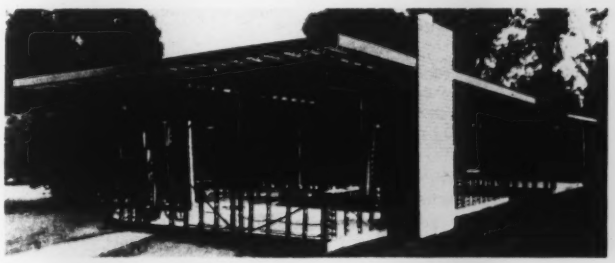
Filtering Through—Low-priority work on the horizon includes plenty of state and local jobs. Some $1.3 billion in municipal bond issues were approved by voters last month to finance roads, schools, bridges, hospitals, sewers, water systems, airports. About $4 billion in construction work is promised by schools, stores, garages, hospitals and institutions, sewage and water systems.

Overage, overworked highways will get a lot of needed attention in the years ahead too. For five years highway and toll road construction has smashed its own record. It will hit about $3 billion in '53, and should go even higher in following years. Building by utilities, both electric and natural gas, will blossom rapidly, showing a big percentage gain over '52. Railroads and telephone companies will hold at about present levels. Total utility spending for construction is estimated at about $4.3 billion—its tenth consecutive year of expansion.

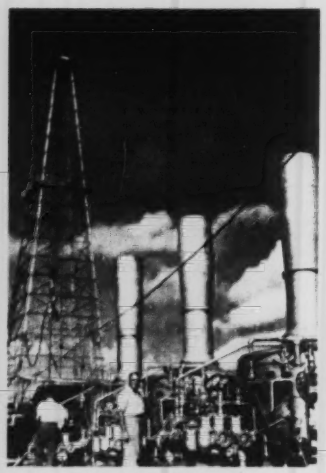
Geared to Produce — Private homebuilding won't be a weak sister either. Today a million-house production yearly seems restrictive to an industry that five years ago believed it nearly impossible. Because industry is geared to produce one million units, it will do so in 1953 though price, design and size competition will develop among builders. Any drop in units will be slight, less than 5 per cent below this year's total of over 1.1 million starts. Dollar volume could exceed this year's, though, because of the great number of starts this fall.

Maintenance, repair and modernization markets are blooming with each new structure added. Potential of this segment of construction expands as fast as that for new buildings. Public housing, already low, will drop below the 35,000 units erected in 1952.

Carrying a full load of military work while trying to sate a neglected civilian market will keep the $33 billion construction colossus fully occupied next year. After keeping their fingers crossed for months over a possible downturn, builders relish the assignment.



Framework for this ranch-style house is made of light, low cost structural steel, Lightsteel, made by Penn Metal Co. Inc. at Parkersburg, W. Va.



Test Steam Generators

Generators to supply steam for one of Standard-Vacuum Oil Co.'s oil refineries and for drilling oil wells are tested by the manufacturers, Texstream Corp., Houston, a division of Vapor Heating Corp., Chicago. A Texstream representative will fly to Sumatra, Indonesia, to supervise installation at facilities of Standard-Vacuum Oil

Steel Mill for India

Both Japan and India are putting up the money for the new 1 million ton facility

PLANS to build a $100-million steel mill in India were pushed forward during a recent visit to the U.S. by the Japanese industrialist, Tatsunosuke Takasaki. Purpose of the mill, to be financed jointly by the Japanese and Indian governments and a large World Bank loan, is to alleviate steel shortages in both India and Japan.

E. E. Swartswelter, president and chairman of Aetna-Standard Engineering Co, Pittsburgh, met with Mr. Takasaki, president of the Aetna affiliate, Aetna Japan Co. Ltd., Tokyo. They discussed the new works which will have two blast furnaces with a combined annual capacity of 400,000 tons of pig iron; an open hearth of 500,000 tons capacity and finishing equipment capable of producing 350,000 tons of bars, structurals, sheets and rails.

Have and Have Not — India's three major steel firms have a total steelmaking capacity of about 1 million tons annually. But Indians have many places where they could use additional supplies, such as their railroad expansion program and hydroelectric expansion program. Unexploited Indian iron ore deposits, earmarked for use in the new steel mill, have tested over 60 per cent iron content. Coking coal is available near the ore deposits.

C.F. & I. Goes East

Western steelmaker will expand in East by purchasing John A. Roebling's Son's Co.

A WESTERN company that chose to expand eastward is convinced its move was in the right direction.

Newest demonstration of that conviction is the step by Colorado Fuel & Iron Corp., Denver, to buy the 111-year-old wiremaking firm of John A. Roebling's Sons Co., Trenton, N. J.

Sale Date The purchase is expected to take place Dec. 31. The Roebling business, with plants at Trenton and nearby Roebling, N. J., will be operated under the Roebling name, with Charles R. Tyson, president of Roebling since 1944, continuing to direct operations of Roebling plants.

Roebling produces steel wire, cold-rolled steel specialties, wire rope, electrical wire and cable and bridge products. C.F. & I. also is one of the leading producers of wire. Marriage of these two companies will make C.F. & I. the country's third largest producer of wire, on the basis of capacity figures issued Jan. 1, 1951, by the American Iron & Steel Institute.

Postwar Move—C.F. & I. began its eastern invasion at about the close of World War II with the purchase in October, 1945, of Wickwire Spencer Steel Co., which had plants at Clinton, Mass., Worcester, Mass., Palmer, Mass., Mt. Wolf, Pa., Newark, N. J., and Buffalo.

In March of 1951, C.F. & I. bought the long-established Worth Steel Co., Claymont, Del. The Claymont plant was made a direct part of the parent corporation.

Supply Insurance—In January, 1952, C.F. & I. acquired the E. & G. Brooke Iron Co., which owned and operated a blast furnace and sintering plant at Birdsboro, Pa.

In the Western Sun—C.F. & I. western operations, include a steel works at Pueblo, Colo., and a subsidiary, California Wire Cloth Corp., with works at Oakland and South San Francisco.

Acquisition of the Roebling company gives C.F. & I. another site along the Delaware river, where the industrial tide is at new heights with construction of the Fairless Works.

U.S. Steel, Bethlehem Expand

U.S. Steel Co. last week lit the first blast furnace at its new Fairless Works at Morrisville, Pa. The first open hearth was tapped the same day, Dec. 11. Fairless will eventually add 1.8 million tons to U.S. Steel's annual ingot capacity.

Because of the drama of the Fairless works, Bethlehem Steel Co.'s expansions in the east have been often overlooked. When its present expansion program is concluded within about a year, Bethlehem will have added 5.6 million tons to the annual capacity of all its plants, bringing its total to 18.5 million tons.

Of that total capacity, more than 15.5 million tons is situated advantageously for serving eastern markets.

SELECTED DEFENSE CONTRACTS IN EXCESS OF $100,000

PRODUCT	CONTRACTOR
Lathes, Turret	Jones & Lamson Machine Co., Springfield, Vt.
Trucks, Light	Ford Motor Co., Dearborn, Mich.
Trucks	General Motors Corp., Detroit
Small Arms Parts	Nevins Mfg. Co., Detroit
Cartridges	Federal Laboratories Inc., Pittsburgh
Parts for Rockets	Wald Industries Inc., Huntingdon, Pa.
Grenades	Geo. K. Garrett Co., Inc., Philadelphia
Grenades, Rifle	United Specialties Co., Mitchel Div., Philadelphia
Bombs, 100 lb.	Allen Mfg. Co., Nashville, Tenn.
Aircraft Parts	Douglas Aircraft Co. Inc., Santa Monica, Calif.
Ingition Parts	Bendix Aviation Corp., Detroit
Valve Assemblies	Wm. R. Whittaker Co., Ltd., Los Angeles
Parts for Diesel Engines	Fairbanks, Morse & Co., Chicago
	Cummins Engine Co., Inc., Columbus, Ind.
Amplifiers	Federal Electric Products Co., Newark, N. J.

New Press Will Forge Aluminum Fans

Mounted on a flatcar, this hydraulic forging press is a new arrival at AiResearch Mfg. Co., Phoenix, Ariz. It will forge aluminum fans, integral parts of AiResearch's aircraft refrigeration equipment. The press, having a capacity of 1100 tons under 2350 pounds pressure, was built by Lake Erie Engineering Corp., Buffalo. A special building houses the press which stands 19½ feet above floor level

DPA Sets 20 Goals; Small Business Gets Share

IN A SERIES of actions, Defense Production Administration set new or revised expansion goals for 20 classifications of products extending in some cases to 1956. Simultaneously, Small Defense Plants Administration announces that portions of these goals are set aside for small business shares.

SDPA assigns to small business one-third of the total expansion in each of the following fields: Steam boilers, heavy metal tanks, tubular heat exchangers, regenerative air preheaters and condensers. Substantial portions of those are still open for fast write-off.

11 Per Cent—Another 11 per cent of the respective goals is set aside for small business in water wheel driven generators, steam turbines and hydraulic turbines. Considerable portions of those programs also are open for fast write-off. Thirty per cent of the expansion in chemical manufacturing equipment is reserved for small business, and about $4 million worth is open for write-off.

In addition, SDPA set a goal of $31 million in capital investment for conversion of present tin can manufacturing facilities to processes requiring use of less tin. Thirteen per cent is for small business, with $26.5 million still open.

Certificates of necessity are issued for all or nearly all of the programs in antifriction bearings, ferrous and nonferrous scrap processing facilities, abrasives and high-quality lubricating oil detergents.

PROGRAM	GOAL	TERMINAL DATES
Scientific inst. facilities	$45,000,000	Jan. 1, 1955
Mech. power trans. equip.	$12,000,000	Jan. 1, 1951-July 1, 1953
Antifriction bearings	$90,000,000	Jan. 1, 1954
Met. scrap process. facilities	$55,000,000	Jan. 1, 1954
Abrasive products	$34,000,000	July 1, 1953
Chemical manufacturing equip.	$11,000,000	——
Naphthalene	564,000,000 lbs	Jan. 1, 1955
Cobalt	27,000,000 lbs yearly	1955
High-qual. lub. oil	28,000 bbl daily	1955
High-qual. lub. oil detergents	15,000,000 lbs monthly	Jan. 1, 1953
Heavy metal tanks	250,000 tons	*
Compressed gas cylinders	300,000 tons yearly	Jan. 1, 1956
Tubular heat exchangers	20,000,000 sq ft	*
Condensers	5,000,000 sq ft	*
Water wheel driven generators	800,000 kw	*
Steam turbines	6,500,000 kw	*
Hydraulic turbines	1,000,000 hp	*
Ocean-going tankers	100	——
Regenerative air preheaters	228	*
Steam boilers	105,000,000 lbs steam/hr/yr	*

*Goal is in addition to that in existence on Jan. 1, 1951.

CHECKLIST ON CONTROLS

Materials Order

FERRO-TUNGSTEN—Schedule 3 of NPA Order M-80 was revoked effective Dec. 9, 1952, removing allocation control from ferro-tungsten.

Price Regulations

ORE CARRIERS—Amendment 2 of Supplementary Regulation 12 of General Ceiling Price Regulation, issued and effective Dec. 3, 1952, grants to 27 Great Lakes contract water carriers a ceiling price increase of $0.10 per gross ton from July 26, 1952, to Dec. 31, 1952. After the later date, ceiling price will revert to the Dec. 1, 1952, level.

ALUMINUM—General Overriding Regulation 41, issued Dec. 5, 1952, and effective Dec. 10, authorizes ceiling prices of 7 per cent above the manufacturers' current selling price for sheet aluminum cooking utensils and 8.5 per cent above the manufacturers' current selling price for cast aluminum cooking utensils.

IRON, STEEL — Amendment 3 of Revision 1 of Supplementary Regulation 100 of General Ceiling Price Regulation, issued and effective Dec. 4, 1952, in order to eliminate confusion, amplifies the definition of "extras and deductions" as applied to base prices used by producers of iron and steel mill products.

GOVERNMENT EXPORTS — Amendment 4 of Revision 1 of General Overriding Regulation 2, issued and effective Dec. 10, 1952, authorizes the addition of special packaging, marking and handling expenses to the ceiling prices of commodities sold for shipment overseas by the government.

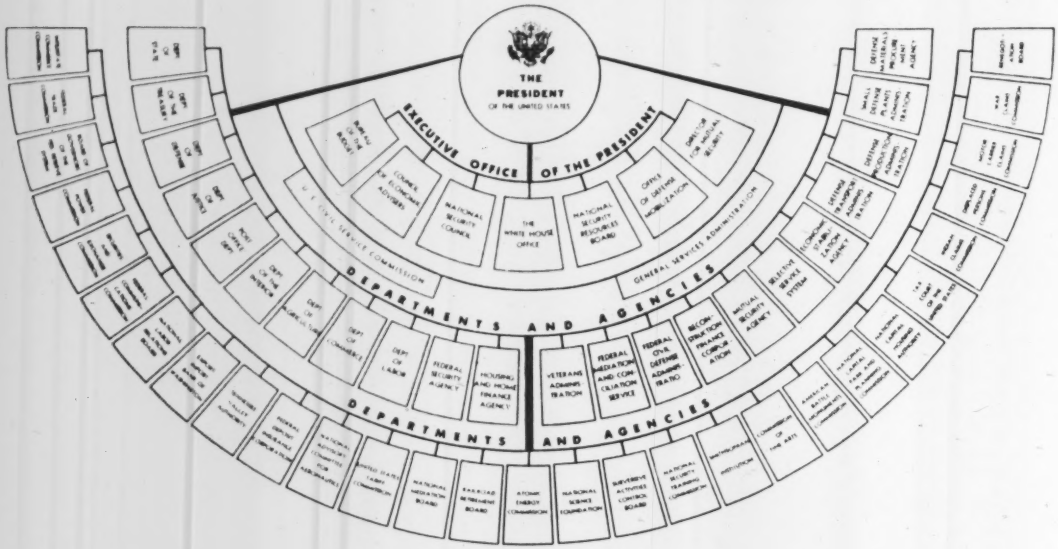
SPRINGS, STAMPINGS, ETC. — Amendment 3 of CPR 119, effective Dec. 20, 1952, permits manufacturers of mechanical precision springs, metal stampings and screw machine products who process customers' material to compute their prices under CPR 119.

COPPER CLAD STEEL—Amendment 3 of General Overriding Regulation 35, issued Dec. 10, 1952, and effective Dec. 20, permits a manufacturer who uses more than one metal in his products to reflect in his ceiling price the increased cost of both metals. It adds copper clad steel to the appendix in GOR 35 and allows pass-throughs of 4.7 per cent in the price of the steel and 3.84 cents per pound of copper.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

Will This Complicated Executive Setup Be Replaced?



Watch for a Presidential Office Streamlining

DRAWING UPON the management philosophy of big corporations, the National Planning Association presents a plan for reorganizing the office of the President to improve government.

Written by Bradley D. Nash, former consultant to the National Security Resources Board and other government agencies, the report commands attention by both its content and the competence of the men who contributed to its conception. Included are: Sumner T. Pike, H. Struve Hensel, Oswald Knauth, Chester L. Barnard, Daniel W. Bell, Louis Brownlow, Luther H. Gulick, Robert Heller, Arthur M. Hill, Eric Johnston, Clark H. Minor, H. Christian Sonne, Beardsley Ruml, Harry A. Bullis, Wayne Chatfield Taylor and others.

In a Nutshell—The plan would replace the unwieldy and rigid collection of staff aids and operating bureaus by a very few, well co-ordinated units. They would be charged with the sole function of helping the President carry out his heavy administrative responsibilities for developing programs, co-ordinating them and analyzing the progress made in enacting them.

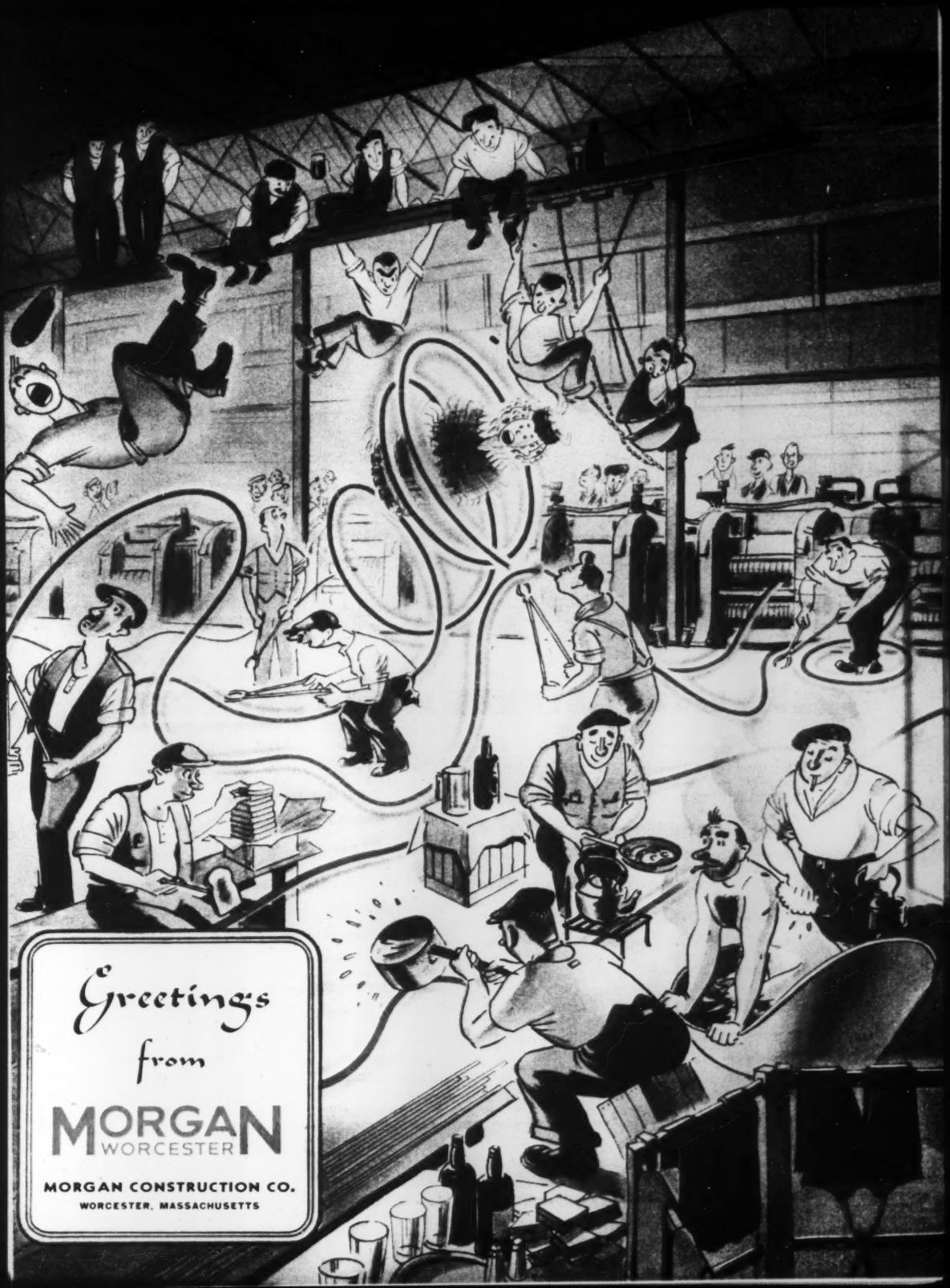
Fewer people and units would report directly to the President, relieving him of operational responsibilities and freeing him to concentrate on managerial and policy-making questions.

By Absorption—There would be an Office of Policy & Program Development which would absorb the Council of Economic Advisors, National Security Resources Board, Legislative Reference Service Division of the Bureau of the Budget, etc. There would be an Office of Co-ordination which would absorb the management assistants of the President who now clutter up the Executive Offices building.

There would be an Office of Budget & Review which would absorb and expand the Bureau of the Budget with a view to creating a more effective tool for implementing the President's efforts to remove waste and duplication, get greater economy and efficiency in the federal government.

It Looks Good—Based in large part on practices that long have been employed by industrial management, the plan looks good. It does not attempt to freeze the President's approach on managerial problems. It seeks only to eliminate the present-day, time-consuming red tape with the end result that the President would have more time to spend as he would prefer to spend it and to see people he needs to see.

Certainly, the plan should receive earnest consideration by the incoming administration in its determination to clean up "the mess" in Washington.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from
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MORGAN CONSTRUCTION CO.
WORCESTER, MASSACHUSETTS

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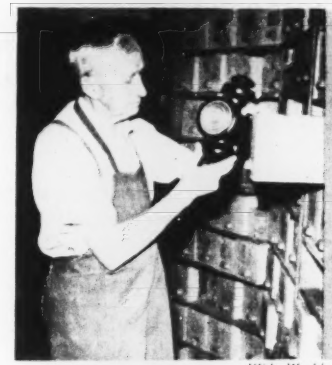
FROM MODEL Ts TO MODELS MODERN . . .



Wide World

Model T parts czar William Scharff, left, examines an oil lamp used from 1915 to 1926. He is proud of a telegram seeking a 1915 Ford carburetor. It came from Ford Motor Co. Stockpiling parts when the Model A was introduced, Scharff now adds parts as he finds them . . . Synthetic, but continental flavor is added by these snap-on hub caps, right, manufactured by Calnevar Co., Los Angeles. Gaylord-Shelton Inc., Chicago hair pin manufacturer, is also planning to produce the sets selling at about one-fourth the cost of the real item and expects 1953 sales to gross $20 million

Replacement Parts Are a $2.5-Billion Business

YOU AREN'T the only one wondering what will go wrong with your car next. Replacement parts makers live by anticipating your troubles, but even with statistics to guide them it's quite possible the right part won't be in the right place at the right time.

The trouble is that parts makers literally don't know where their next orders are coming from. Their goal is to keep dealer stocks slightly above demand level, but freaks in demand constantly arise. Unusually slippery streets increase fender amortization and an epidemic of chuck-holes in a city's pavement can quickly exhaust supplies of springs and front-end parts in the area. So this year demand for springs and fenders could be high—or it could be low. How would you plan production?

Clairvoyance and Statistics—Parts makers are open to suggestions, but they do have a few statistics to help them. They know that the demand for replacement parts is proportional to the percentage of older cars in operation. That's what pushed their sales to an alltime $2.5 billion peak in 1951 as owners struggled to patch the pre-war cars still on the road.

They know too that major mechanical replacements start when a car is about three to five years old, so they're setting production quotas still higher in 1953 as the bumper crop of 1950 autos hit the oxide age. But paradoxically, 1952's expected rise did not materialize as overstocked dealers bought only $2.4 billion worth of assorted patches. So there's considerable temerity in the heightened 1953 goals.

Hoods Up Thinking—The guessing game they play is serious business, for taking a fender die out of storage for a re-run of a certain model-part on the shortage list may cost tens of thousands of dollars. To hedge against this happy-go-unlucky market, many parts makers supply both the original equipment and replacement parts field. Their original equipment volume helps carry their replacement indiscretions, while the replacement business shields them from dips in new-car output.

Automakers also make replacement parts and have been accused by some wholesalers of channeling their limited steel supplies into new cars rather than providing an ample parts volume. Activities of some auto companies disprove this in part, for one maker's parts sales department has been campaigning to boost dealers' inventories while others are urging their car dealers to stock only factory-made items. Purpose of these moves is to assure reasonable parts volume production.

Where Your Money Goes—Exports of auto parts give a clue to the products in greatest demand. In 1951, starting and ignition equipment led third-place batteries more than two to one with replacement engines in between. Next came brake linings and then spark plugs and leaf springs.

Military vehicles have created unusual demand. New military equipment is received by the services with spare parts kits which last about two years. But the military equipment in Korea is almost entirely of World War II vintage and now requires a lot more parts than normal to maintain it. So while new trucks are rolling off the lines, one important supplier is doing 10 per cent of his business in this category.

Finally, CMP — Metals allocation hampered parts production somewhat during 1952 but should be adequate by next quarter. Possible exceptions may include such items as axles and gears from forged bars and 5260 chromium alloy steel for springs, while a peculiar shortage currently exists in high-density castings for brake cylinders for one firm.

So it looks as though parts makers can go back to their number one worry with that record production quota in 1953: Eccentric demand. The next time you crumple a fin on your Fishtail 8 and have to lay it up for a month before it's back in swimming condition, give thought to the replacement parts maker who ardently wishes he could sell you one but had his stocks exhausted by a month of slippery streets.

WESTERN EUROPE SEEKS ANSWER TO

FRANCE

High production costs and competition cut French exports 8 per cent over eight months even as steel output was rising to record highs. France's answer in 1953 will be continued steel expansion and plant modernization

AMERICAN machinery helps build a new airstrip at Le Bourget Airport, near Paris

FRENCH METALWORKING industries met the challenge of increasing pressure from foreign competition during the last half of 1952 with a new seven-year expansion plan for the French steel industry and by knocking the props from under artificially maintained domestic steel prices.

The Comptoir Francais des Produits Siderurgiques, formerly the sole pricing and sales organization for all French steel, was forced by law to confine its activity to export sales only. Individual steel mills had to reorganize their sales forces and compete with each other price-

HERE are two more articles in a series on the economic past, present and future of major Western European countries. On Dec. 8 we wrote about Italy and Sweden. Next week, Dec. 22, we discuss Great Britain and West Germany. A summary of the situation in Western Europe will appear Dec. 29. Complete iron and steel statistics for all industrial nations of the world will be carried in our 1953 Metalworking Yearbook, Jan. 5.

BELGIUM

Instead of striving for all-out production, Belgian steel producers planned for more efficient output. Increased productivity, in some Belgian firms up 20 to 40 per cent from 1950, will be the key to 1953 activity

BELGIUM was one of the few European countries which did not increase its total production of steel in 1952 over that in 1951. In contrast to the preceding year, Belgian producers found the market would not bear all the steel which could possibly be turned out regardless of price.

Output had to be better planned with an eye to reducing production costs. Late in 1952, many orders were contingent on short delivery dates; particularly on U.S. orders.

Nemesis—During the first quarter the average monthly steel production was at a higher level than for 1951 (3,117,000 tons vs 2,860,000), but production dropped constantly from April to August. Orders from the U. S. and Germany caused a firming of export trade and prices in the third quarter and brought total steel output up to approximately 5,450,000 tons against 5,666,000 tons in 1951.

Following the Leader—The metalworking and processing industries followed approximately the same pattern as the steel industry. After an active period during the first three or four months of the year, business fell off in practically all sectors. Experiencing the same difficulties in export trade as the steel industry, metalworking firms had to find new outlets and give more attention to the home market. Defense orders enabled some Belgian companies to compensate for the decrease of export trade, but in general firms which had not installed new equipment and were unable to produce at lowered costs found the times difficult.

Since 1950, productivity in the metal-consuming industries is estimated to have increased at least 5 per cent, based on weight of prod-

FALLING EXPORTS PROBLEM

wise and qualitywise in the home market.

More Steel — Behind these new salesmen was a record steel production of about 12 million tons in 1952, compared with 10,818,500 tons last year. Steel output in the Saar was 3,130,000 tons in 1952 against 2,863,300 tons in 1951. Net result was more steel available with very little variation in prices from those of late 1951.

Despite the production gains, a plan to bring French steelmaking capacity, when coupled with the Saar, to 23 million tons was studied. A $1,280,000,000 bill to finance the project will be presented to the French parliament.

Food for Industry—Nonferrous mining and metals production increased, too, in 1952. Extraction of lead concentrates went up from 11,500 tons in 1948 to 20,000 tons in 1952, against a target of 15,000 tons. Zinc extraction grew from 12,200 tons in 1948 to 26,500 tons in 1952. Expansion is planned for aluminum production where 130,000 tons of capacity yielded 115,000 tons of metal in 1952. Altogether some $19,570,000 is budgeted for this expansion.

While the amount of steel consumed by processing industries showed an increase in 1952, the volume of orders booked, especially in export trade, gave Frenchmen a major cause for concern. For the first eight months of the year exports were 8 per cent less than in the corresponding period of 1951.

Case History—Typical, perhaps, is the case of the French automobile industry. Output of private automobiles more than made up a slump in commercial vehicle production. Total output of cars in 1952 was about 500,000, ranking France third in the automotive field behind the U.S. and Britain.

However, French exports of automobiles fell behind; during the first half of 1952 exports were 57,500 vehicles compared with 69,300 in the first six months of 1951. The drop was due to high production costs and increased competition from Great Britain and Germany. German competition was also intense in the machine tool trade.

Wait for Steel—Backlogs of export orders for French steel products decreased from midyear levels and in October the following delays on delivery prevailed: Reinforcing bars and angles—6 to 9 months; plates—2 to 3 months.

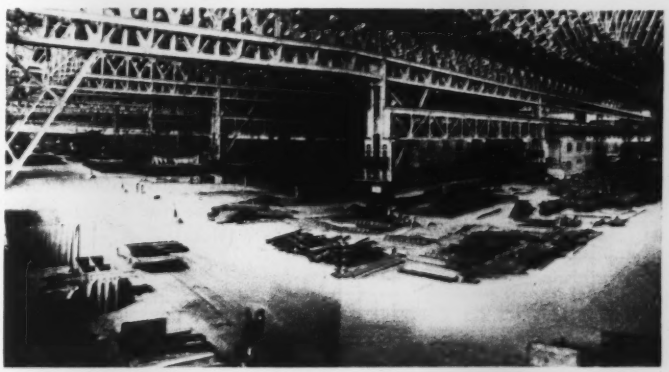
Reassuring, but so far only a mildly effective aid to French metalworking men, are Premier Antoine Pinay's anti-inflation measures. The Schuman Plan, too, holds promise of easing the drain on the French economy made by the purchases of raw materials. But France is centering her hope of capitalizing on foreign markets through continued expansion of her steel industry and modernization of her metalworking plants.

ucts. Computations based on weight tend to minimize the growth of productivity, though, as the metalworking industries have sought to reduce weight by every means possible. In certain companies, productivity is up 20 to 40 per cent.

Disparity in Wages—Developing greater productivity is the nub of Belgium's answer to slackening demand and growing competition. The creation of Benelux, making Belgium, Luxemburg and the Netherlands a common market for products, widened the sphere of consumption for some Belgian products. But, the disparity in labor costs and government price controls among the partners leaves Belgium open to many foreign products which are cheaper than her own.

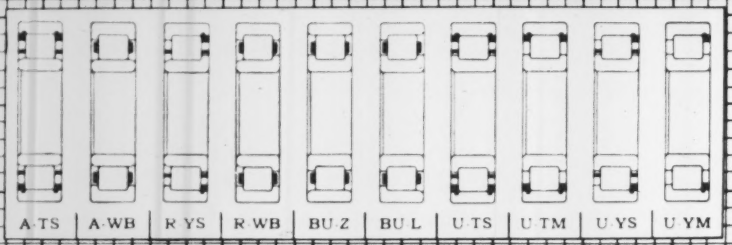
Belgium fears a similar invasion of steel and coal coming from countries where wages are lower under the Schuman Plan. Should the prices for steel and coal become uniform for the six countries of the coal and steel community, without regard for wage differences between Belgium and the other member countries, the Belgian coal and steel industries are bound to be adversely affected. For example, Belgian coal mines are more difficult to work than those in the Ruhr or Netherland-Limburg. Wages are about 30 per cent lower in Holland than in Belgium.

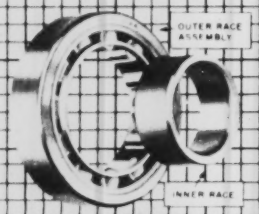
That's why the Belgians will be concentrating more on lowering costs and raising productivity in 1953 than on setting output records.

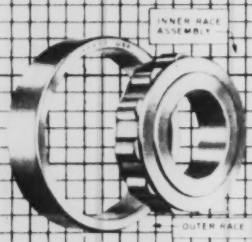


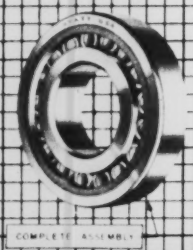
SHIPYARD WELDING SHOP OF THE COCKERILL FIRM IN ANTWERP, BELGIUM
. . . shipbuilders had a busier 1952 but steelmakers only held even with 1951

HYATT HY-LOAD wide variety permits exact selection of bearing type and size









HERE are the ten different types of Hyatt Hy-Load Roller Bearings. Four of these are constructed with separable inner races, two have separable outer races and four are non-separable. And each type is built in several widths and in a wide variety of sizes—a Hyatt Hy-Load for every radial bearing application need.

Hyatt Hy-Loads are high capacity cylindrical roller bearings for radial loads or light or intermittent thrust loads. All separable parts are freely interchangeable. Any inner or outer race will fit any roller assembly of the same number, permitting non-selective fitting after pre-assembling the two bearing parts in separable machine elements. The separable race can be omitted and rollers operated directly on the shaft or in the housing bore in instances where the bearing operating surfaces can be of suitable hardness and finish.

These are reasons why Hyatt Hy-Load Roller Bearings have so many possible applications in machinery and equipment used in so many different industries. For more complete information on the Hyatt Hy-Load line write for Catalog No. 547. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom

The 12-volt electrical system will be on some 1953 cars with high compression engines. The shift has been quiet, so some suppliers and service places are unprepared

IF YOU buy a 1953 car with a 12-volt electrical system you're going to have a lot of automotive electrical engineers closely watching your future service record.

The 12-volt system is, of course, no innovation. Foreign cars, military vehicles and many commercial trucks have it. But until now the U. S. passenger car industry has not been willing to make the change and has been able to get satisfactory performance with six-volt equipment.

The Reason Why—The new high compression ratio of several 1953 cars changes the picture. Electrical experts figure 8 to 1 is about the highest compression ratio a six-volt system can fire. Several of the improved engines will go over that figure. A Cadillac engineer explains that his car is experimentally equipped with an 8.25 to 1 engine and a six-volt system, but it is kept in peak condition at all times by plant and proving ground mechanics. His plugs aren't permitted to foul, etc., and he has had no difficulty. But if you as the average owner have an 8 to 1 engine, you're probably in trouble without 12 volts to push the spark across the gap.

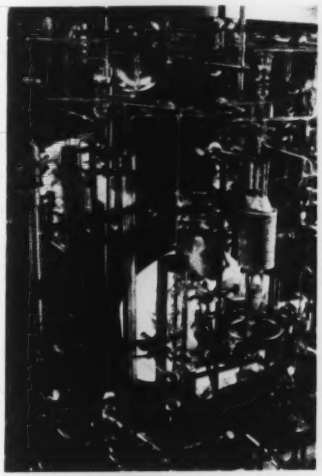
One reason there will be close tabs kept on each of the new 12-volt equipped cars is that too few "bugs" have developed in the test cars and laboratory experiments with the higher voltage system. Engineers are telling each other right now it's too good to be true. For example they figured that the finer filament in 12-volt lamps would be more susceptible to breakage from road bumps.

Merits—Advantages of the 12-volt electrical system are many. It provides a hotter spark. Its starter turns the engine over much faster. It saves copper. Smaller units (battery excepted) can do more work.

Disadvantages are few. Outstanding one which has kept the 12-volt system from winning industry acceptance is that for an average size car it costs about $5 more. Batteries, requiring six cells, will be higher priced, but not double, and they cannot be produced at the same rate of the common three cell. One maker estimates his lines can produce only 60-70 per cent as many 12-volt units as 6-volt batteries. More attention must be paid to covering the spark plugs because the higher voltage will readily jump down moist porcelain and ground.

Hurried—Some members of the auto industry are making the change without waiting for electrical equipment suppliers to thoroughly re-engineer the product or re-equip their facilities. Result is that some of the electrical system components are in an interim development stage now. The armature in the starter motor, for example, cannot be mass produced on the same equipment used for the six unit, one engineer admits, and will probably have to be retooled and the assembly method changed. If producers of the highest-volume car makes adopt 12 volts, new high-production machinery will be required which presently is not demanded.

Few automaking companies would divulge to their competitors this year that they were working to have 12-volt systems and consequently hampered themselves in dealing with common suppliers. That dealer and other servicing organizations will be able to take the new 12-volt systems in for repairs is surprising because of the attempts made to conceal the development. However, facilities and equipment will be available in most localities.



Puzzle: Find the Engineer

Peering through a glass jungle, project engineer Paul R. Basford of Chrysler Corp., Detroit, conducts experiments with gas adsorption apparatus. His research finds how strongly molecules cling to surfaces under very pure conditions. Findings help decide how tightly paint will stick to a body, what makes a better bond with rubber cement and how well lubricants cling to bearing surfaces of Chrysler cars

Willys Cuts Aero Prices

Willys-Overland Motors Inc. announces reductions in prices for its 1953 Aero passenger car line ranging from $88 to $185. Ward M. Canaday, W-O president, had said last year that prices would come down when volume went up. Living up to this promise, he told his dealers and the press that "the sensational price reductions" were made possible "by higher government (materials) allocations which will permit us to more than double our passenger car production.

Being introduced in dealer showrooms today (Dec. 15) are two new body styles—a hard-top convertible dubbed Aero Eagle, and four-door models in the Aero Lark and new Falcon series. Only two-door sedans had previously been built. The Aero Ace, equipped with a 90-horsepower F-head, 7.6 to 1, six-cylinder engine which also goes into the Eagle, will be brought out in two and four-door models in

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January. This is the top-priced line.

Stylewise, the 1953 Larks have trim details reserved in '52 for the custom and super deluxe lines. The Eagle hardtop has no door posts, a one-piece windshield and wrap around rear window.

That most new model car prices are not going to go up and might in the over-all be slightly down, has become increasingly obvious. Pontiac, first GM division to show its wares, nine days ago made price reductions of up to $100.

Ford Holds Price Line

Ford held the price line Wednesday when Mercurys went on display and Friday when the new Fords took their bows.

Mercury "facelifts" with new chrome side moldings, and chrome "wind splits" on the leading edge of the rear fender. Additionally a heavier chrome hood lip molding and redesigned hood ornament presents a lower, wider front.

Under its hood and below the body are changes aimed at improving engine performance. A new air cleaner and straight-through muffler bring about better breathing and faster acceleration. The overhead-valve V-8 engine for Mercury encountered tooling delays and does not appear in the 1953 model at this time.

Easily recognizable by its new propeller-like grille and Lincoln-esque rear fender trim, the 1953 Ford conceals its main changes from the eye. These take the form of a thorough re-engineering of the suspension system to cut road shock as much as 80 per cent. Major change is to give the front wheels far greater up-and-down travel and to use rubber compression bumpers in limiting this action. Shock absorbers, front and rear, are revealed for a softer action. Rear springs are redesigned to give greater control of their flexibility in manufacture. Leaves are separated with woven fabric inserts with a larger damping surface and 200 per cent longer life.

Hudson Introduces Models

First of Hudson's 1953 offerings reached the public last week when the Hornet, Wasp and Super buzzed on the scene. The Jet, "compact" car to be priced among the big three's volume cars, will not appear until next month. It reportedly is to account for half of Hudson's production within the coming year.

The cars now being shown have been retrimmed with a new grille emphasizing the horizontal line. A false airscoop replaces the hood ornament.

Steering gear ratios are higher, the larger Hornet operating at 25.6 to 1, the shorter wheelbase Wasp and Super Wasp using a 20.2 to 1 ratio. An 18-inch steering wheel further enables the wheels to be turned easily. Both Wasps have compression ratios of 7.2 to 1 with aluminum head and 6.7 to 1 with standard head. The lower-displacement regular Wasp engine has a shorter stroke than the Super. The two-carburetor, two-air cleaner arrangement which Hudson calls "twin H-Power" is available as an extra cost option on the Hornet and Super Wasp.

Auto, Truck Output

U. S. and Canada

	1952	1951
January	409,406	645,688
February	467,691	658,918
March	517,207	792,550
April	576,505	680,281
May	546,673	695,898
June	560,947	653,682
July	246,461	522,858
August	293,722	571,442
September	592,253	505,758
October	645,862	558,971
November	556,366	480,199
December		402,729
Total		7,179,161

Week Ended	1952	1951
Nov. 8	143,610	117,342
Nov. 15	146,825	120,767
Nov. 22	129,224	80,489
Nov. 29	119,781	119,962
Dec. 6	135,593	116,932
Dec. 13	110,000*	115,627

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary.

Motordom Murmurs

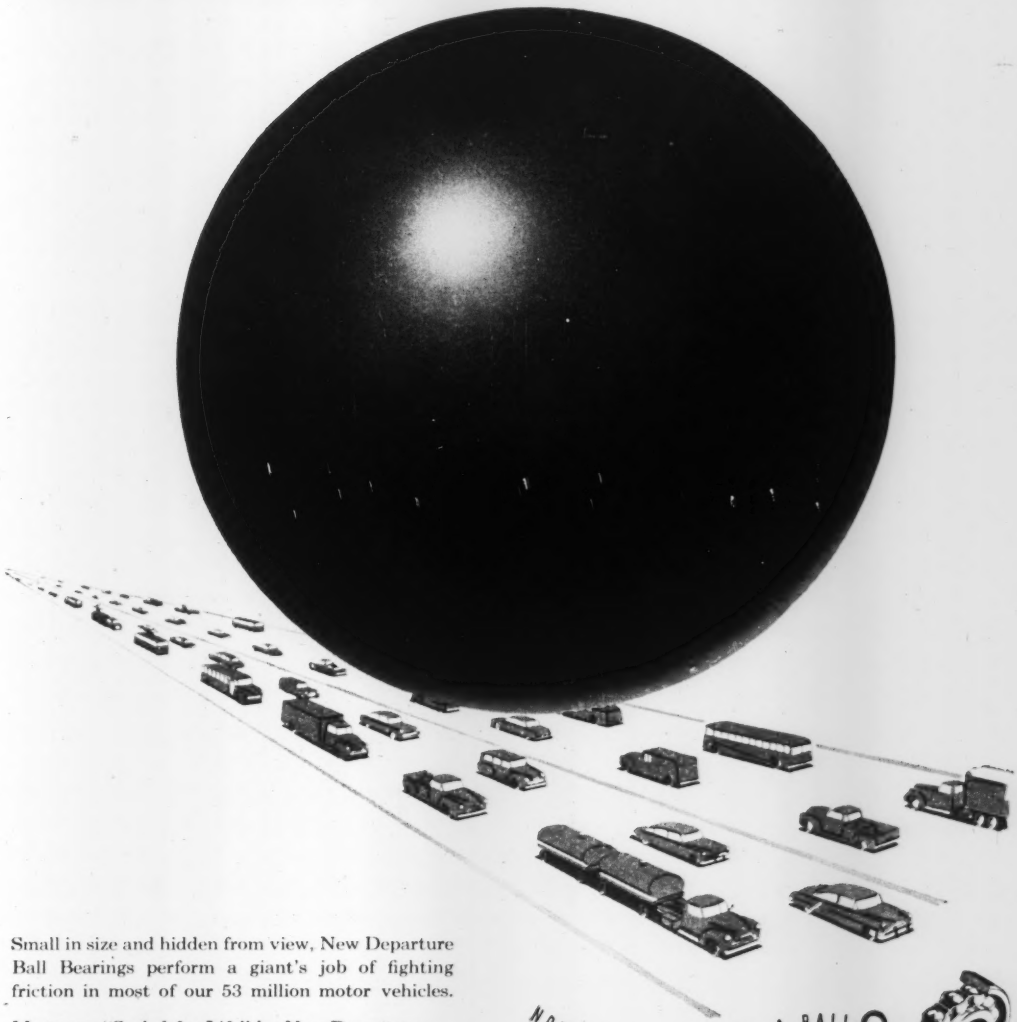
Change in Buick's now plaster-cast aluminum turbine and pump components of Dynaflow is being contemplated if aluminum continues in short supply. The GM division is reportedly considering casting the housing in aluminum instead of iron and, if it makes this change, will redesign the turbine to be of brazed steel stampings, a la powerglide. . . . Rumor, passed on in this column a few weeks ago that the MG is to get an 80-horsepower engine this spring is without truth, says the Nuffield Organization of England. Model "TD continues with the present 1250 C. C. engine," its maker adds. . . . UAW's request for contract changes from Ford drew a blank. The situation shows signs of hotting up. . . . Plastic dies have caught on in the auto industry remarkably fast. There are three die sources now in Detroit; a half dozen more will soon be in production. The big three and several independents are making some steel stampings on plastic dies.

Automation at Buffalo

Newest showplace of "automation" is Ford's 1,291,000-square-foot stamping plant at Buffalo, another link in the highly mechanized automobile production facilities chain the company has set up in the last few years. This plant contains 291 presses, 19 complete lines, makes parts for Ford, Mercury and Lincoln cars, does some subassembly work and can load under roof 50 box cars simultaneously.

Inter-plant TV speeds operations at Ford Motor Co.'s Buffalo factory

Little Giant of the highway



Small in size and hidden from view, New Departure Ball Bearings perform a giant's job of fighting friction in most of our 53 million motor vehicles.

Many are "Sealed-for-Life" by New Departure . . . installed on fan and water pump shafts, propeller shafts, transmissions and rear wheels. With dirt sealed out and lubricant sealed in, they provide longer wear with less care. N-D-Seal bearings also simplify product design and reduce maintenance.

Through its resources of research . . . its engineering excellence . . . its precision production . . . New Departure is the recognized leader. Keep your eye on the BALL to be sure of your BEARINGS!

NOTHING ROLLS LIKE A BALL

NEW DEPARTURE

BALL BEARINGS

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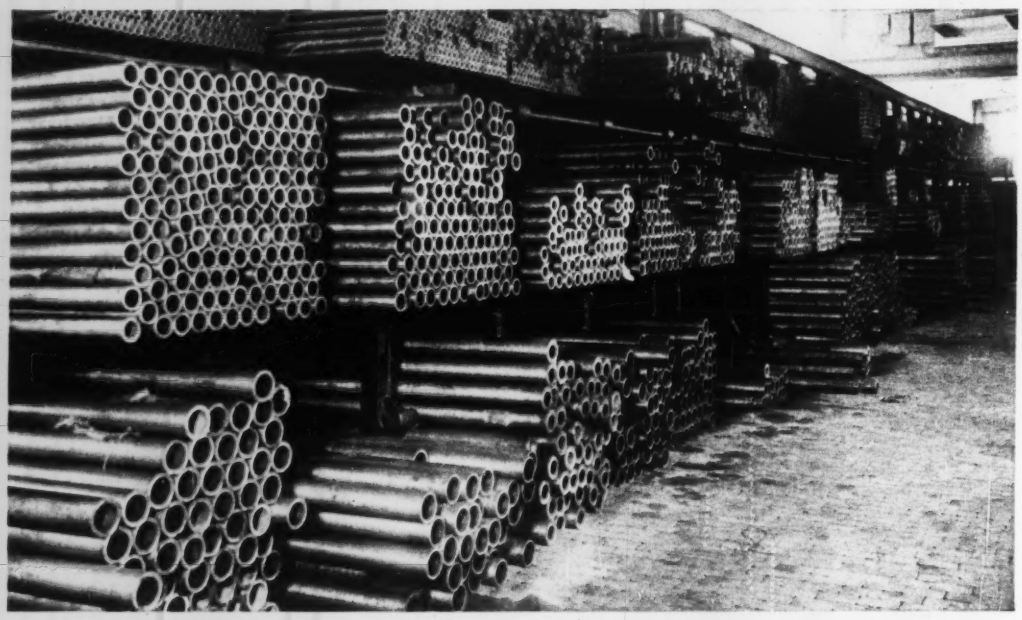
Order wear-resistant 52100 tubing today



...we ship it from here tomorrow!

IF you're in a hurry for wear-resistant 52100 tubing, phone, wire or write the Timken Company. Shipment will be made from mill stock within 24 hours after receipt of your order!

52100 steel tubing manufactured by the Timken Company can be heat treated to file hardness and tempered back to any desired point. A high carbon chrome steel, it is through-hardening in moderate sections and can often be used in place of more expensive steels. It's available in a wide range of sizes from 1" to 10½" O.D.

Timken® 52100 tubing will do many of your hollow parts jobs: aircraft parts, ball bearings, pump parts and plungers, collets, bushings, spindles, grinding machine parts and precision instrument parts, to name a few.

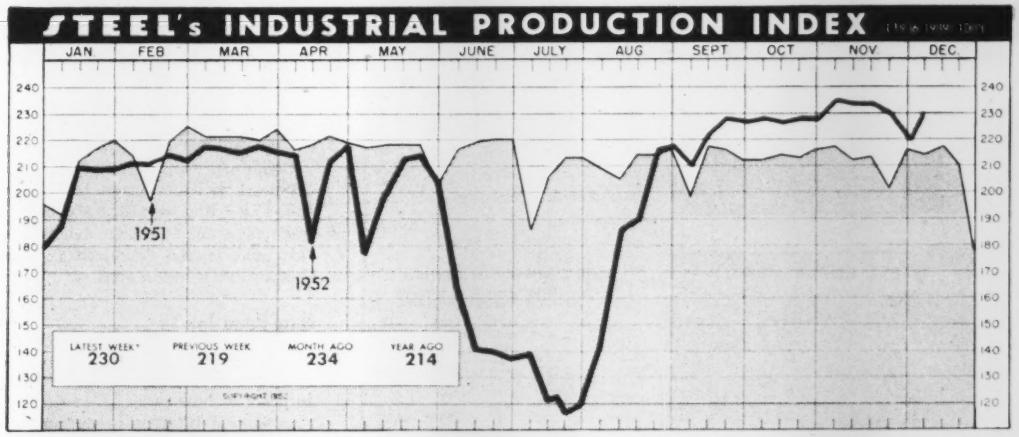
As America's earliest and foremost producer of 52100 tubing, the Timken Company has unequalled experience that results in uniform high quality from tube to tube and order to order. Rigid quality control checks every step of production.

For immediate delivery of your less-than-mill-quantity orders, write, wire or call The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING

The Business Trend



*Week ended Dec. 6.

Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automotive Assemblies (Ward's Reports) 20%.

Makers of consumer durables see bright sales future as rising personal income outpaces living costs. Production index jumps up to former high level after holiday week

BUSINESS may reach a new postwar high during the first half of 1953. Reasons: Defense expenditures are slated to hold firm and production of civilian goods may rise considerably.

Makers of civilian durables are particularly optimistic over the 1953 sales outlook. The public is taking a new interest in durables and is in a better financial position to pay for them. The Commerce Department's Office of Business Economics reports that personal income in October reached an annual rate of $276 billion, or 5.5 per cent more than in October, 1951.

Cost Momentum — Meanwhile, the rise in the cost of living has been comparatively slight. The Bureau of Labor Statistics index of consumer prices for the year ended Nov. 1 climbed about 0.2 per cent to 190.9 per cent of the 1935-1939 average. Much of this upward momentum has been lost since last spring, as commodity prices started dropping throughout the world.

Despite consumer apathy toward Christmas goods, many civilian producers are boosting their output. They are fairly certain that stepped-up promotion techniques will unzip the civilian wallet. But, as sales insurance, many manufacturers this year are adorning their products with more whistles and bells to make older models obsolete.

Output Spurts — Production staged a quick comeback after taking a dip during Thanksgiving week. STEEL's industrial activity index for the week ended Dec. 6, bounced up 11 points to 230 per cent of the 1936-1939 average. Return to a full work week was reflected in freight car loadings and automotive production. Electric power production that week mirrored the rise in industrial operations. Steel production remained at 106 per cent of rated capacity for the fifth consecutive week, for this industry did not slow down during the holiday week.

Steel Furnaces Roar . . .

With consumers pushing the mills for virtually every ton they can get, steel production has remained around 2.2 million tons a week since the end of September. The American Iron & Steel Institute estimates that the nation's furnaces during the week ended Dec. 13 poured 2,191,000 net tons of steel for ingots and castings.

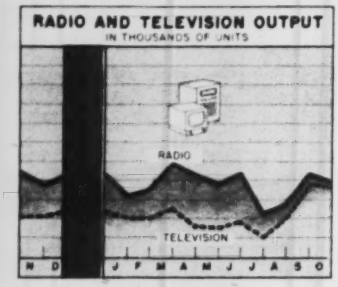
Retail Volume Poor . . .

Christmas shoppers are watching their dollars and worrying retailers caught with bulging inventories.

During the early fall, many store executives were predicting that holiday sales this year would more than top 1951. So far, their predictions haven't been correct. The Federal Reserve Board's weekly index of department store sales in November averaged about 3 per cent under retail volume in the comparable weeks in 1951. Largest drop came in the week ended Nov. 29, when sales plunged 14 per cent under the comparable week of 1951.

Trucks Set Record . . .

Truck manufacturers in the U.S. may close the year with the highest three-month volume in history. The industry is expected to roll out at least 120,000 trucks in December, says *Ward's Automotive Reports*. This scheduled output would bring the fourth-quarter total to a record 367,000 units. The feverish windup, however, won't bring the year's production to the peak

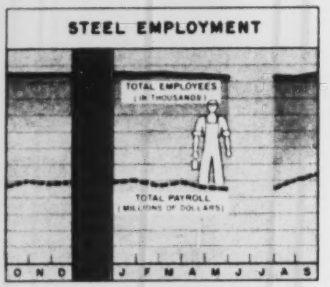


Radio and Television Output

Thousands of Units

	Radio		Television	
	1952	1951	1952	1951
Jan.	632	1,203	405	646
Feb.	759	1,313	409	679
Mar.	976	1,720	511	875
Apr.	848	1,337	323	469
May	748	1,373	309	339
June	874	1,083	361	327
July	442	548	199	152
Aug.	544	563	308	147
Sept.	866	1,109	756	337
Oct.	772	875	724	412
Nov.	...	748	...	415
Dec.	...	851	...	489
Total	...	12,714	...	5,267

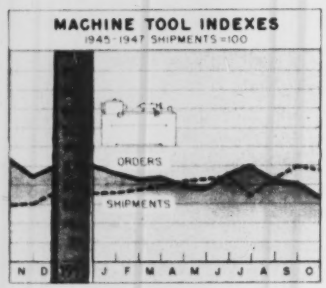
Radio-Television Mfrs. Assn.



Steel Employment, Payrolls

	Employees in Thousands		Payrolls in Millions	
	1952	1951	1952	1951
Jan.	672	657	$252.2	$245.3
Feb.	671	663	234.9	219.4
Mar.	672	663	242.7	238.3
Apr.	670	666	225.6	234.8
May	662	667	223.1	249.0
June	*	674	*	240.7
July	*	678	*	231.9
Aug.	660	679	250.4	247.7
Sept.	674	677	269.4	236.3
Oct.	...	674	...	249.9
Nov.	...	675	...	242.0
Dec.	...	675	...	246.7

*Not available because of steel strike.
American Iron & Steel Institute

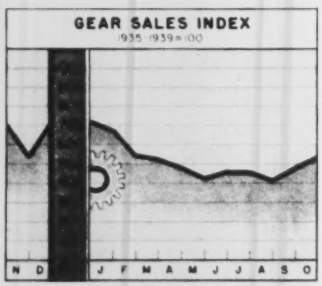


Machine Tool Indexes

1945-1947 Shipments=100

	New Orders		Shipments	
	1952	1951	1952	1951
Jan.	347.8	475.4	266.6	114.3
Feb.	318.8	615.5	279.6	123.8
Mar.	324.3	590.3	299.5	158.9
Apr.	293.5	516.1	307.9	157.7
May	284.6	483.0	323.0	175.1
June	342.9	558.8	330.8	182.8
July	376.3	490.6	259.7	144.7
Aug.	311.1	488.9	317.0	178.9
Sept.	302.4	380.2	368.3	189.8
Oct.	243.7	403.9	357.6	221.3
Nov.	...	330.5	...	226.0
Dec.	...	376.5	...	264.7

National Machine Tool Builders' Assn.



Gear Sales Index

1935-1939=100

	1952	1951	1950
Jan.	670.6	764.6	280.2
Feb.	539.5	806.1	272.9
Mar.	517.1	830.7	358.4
Apr.	478.7	742.5	328.6
May	425.9	667.1	363.1
June	452.3	800.9	401.0
July	453.9	589.1	410.7
Aug.	413.9	564.2	617.4
Sept.	485.0	630.1	654.5
Oct.	533.1	703.4	564.8
Nov.	...	530.0	554.9
Dec.	...	716.5	680.4

American Gears Mfrs. Assn.

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Issue Dates on other FACTS and FIGURES Published by STEEL

Construction	Nov. 24	Indus. Production	Nov. 17	Refrigerators	Dec. 8
Durable Goods	Sept. 22	Ironers	Nov. 10	Steel Castings	Nov. 3
Employ. Metalwkg.	Oct. 27	Malleable Castings	Nov. 3	Steel Forgings	Oct. 20
Fab. Struc. Steel	Oct. 27	Pumps	Dec. 8	Steel Shipments	Nov. 3
Foundry Equip.	Nov. 24	Prices, Consumer	Dec. 1	Vacuum Cleaners	Nov. 10
Freight Cars	Nov. 24	Prices, Wholesale	Dec. 1	Wages, Metalwkg.	Nov. 17
Furnaces, Indus.	Nov. 24	Ranges, Elec.	Dec. 8	Washers	Dec. 1
Gray Iron Castings	Nov. 4	Ranges, Gas	Dec. 1	Water Heaters	Dec. 8

1,412,256 trucks built in 1951. Truck production this year may reach 1,210,000 units, or 4 per cent under the 1951 volume.

U.S. passenger car production is shifting into high-gear. With most model change-over periods ending, carmakers produced 96,977 units in the week ended Dec. 6. This turnout is 6671 units over car assemblies a year earlier.

Combined U.S. and Canadian car-truck production in the week ended Dec. 6 reached 135,593 units, well over the 116,932 passenger cars and trucks produced in the comparable week in 1951.

New Peak for TV . . .

TV set makers are in the happy position of having two powerful forces on their side: Consumers' reawakened interest in appliances and new sending stations. Biggest boon will probably be the new stations. The Federal Communications Commission has ok'd the building of 120 new stations since it lifted its construction ban in June. Persons in areas now videoless are expected to clamor for sets. And TV producers are determined not to be caught short.

Production of television receivers in October soared 75 per cent over the same month in 1951. Radio-Television *Manufacturers* Association says 724,117 TV units were assembled that month, compared with 411,867 TV sets in October, 1951.

Companies producing both TV and radio receivers, are, to some extent, having to "rob Peter to pay Paul." Radio production during October skidded to 772,346 units from the 1.3 million-unit average in the first half of 1951.

Building Levels High . . .

Construction activity is dipping seasonally but it still is above 1951 levels. The Bureau of Labor Statistics says that expenditures for new construction in November totaled $2.8 billion, down 7 per cent from October but 6.7 per cent over construction outlays in November, 1951. Outlays for private nonfarm housing remained above the $1 billion level for the fifth consecutive month—insuring a certain demand for plumbing fix-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	106.0	106.0	103.5
Electric Power Distributed (million kwhr)	8,165	7,701	7,476
Bituminous Coal Output (daily av.—1000 tons)	1,500	1,737	2,031
Petroleum Production (daily av.—1000 bbl)	6,650	6,669	6,246
Construction Volume (ENR—millions)	$344.2	$203.0	$324.1
Automobile, Truck Output (Ward's—units)	135,593	119,781	116,932
TRADE			
Freight Car Loadings (unit—1000 cars)	820	670	822
Business Failures (Dun & Bradstreet, number)	120	127	136
Currency in Circulation (millions)[3]	$30,274	$30,152	$28,891
Dept. Store Sales (changes from year ago)[3]	−14%	+9%	−1%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$16,809	$17,833	$17,473
Federal Gross Debt (billions)	$267.3	$267.2	$259.5
Bond Volume, NYSE (millions)	$21.6	$18.8	$17.6
Stocks Sales, NYSE (thousands of shares)	8,400	8,112	8,244
Loans and Investments (billions)[4]	$78.5	$77.1	$73.3
United States Gov't. Obligations Held (billions)[4]	$33.0	$31.9	$32.1
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	181.31	181.31	171.92
STEEL's Nonferrous Metal Price Index[6]	213.2	213.2	234.9
All Commodities[7]	110.2	110.0	113.7
All Commodities Other Than Farm and Foods[7]	113.0	113.0	114.6

*Dates on request. [2]Preliminary. [3]Weekly capacities, net tons: 1951, 1,999,035; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

tures and some other household appliances.

Industrial construction for private companies was continuing about 6 per cent under November of last year, as more defense expansion goals neared completion. Work on atomic energy projects in November pushed the public industrial category up 34 per cent above the same month in 1951 (see p. 78 for the 1953 construction outlook).

Foundry Equipment Falls . . .

Orders for foundry equipment are continuing to fall well beneath those of 1951. The Foundry Equipment Manufacturers Association says new orders closed for foundry equipment in October totaled $1.5 million, compared with $1.7 million in October, 1951. This is about half the valuation of awards placed in January, 1951. Since then, foundry equipment awards have continued to slide.

Freight Car Orders Lag . . .

Freight car builders are still whittling away on their enormous backlog, despite a scarcity of steel and predictions of a rapid growth in the need for new cars. The American Railway Car Institute reports that 5929 new domestic cars were delivered in November, while incoming orders totaled only 2878 units.

The industry's large order backlog in November inched down to 87,657 units. Cars on order have declined almost steadily since April of 1951, when companies had 158,619 freight cars listed on their order books.

Oil Output Hits Peak . . .

As the nation's defense and civilian production lines roll faster, oil output is moving into record territory. The American Petroleum Institute estimates that the U.S. daily output averaged 6,668,550 barrels of crude and condensate. The outlook for further gains, however, is dimmed by the reduced allowable in Texas this month.

Trends Fore and Aft . . .

World consumption of natural and synthetic rubber in 1952 by Nov. 1 declined slightly under 1951, U.S. consumption rose, while foreign consumption — excluding Russia and China—edged down. . . The nation's railroads in 1952 moved more than 52 million tons of Lake Superior ore, about 19 per cent over 1951 railroad ore tonnage.

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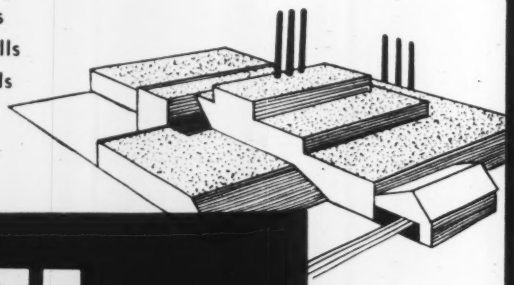
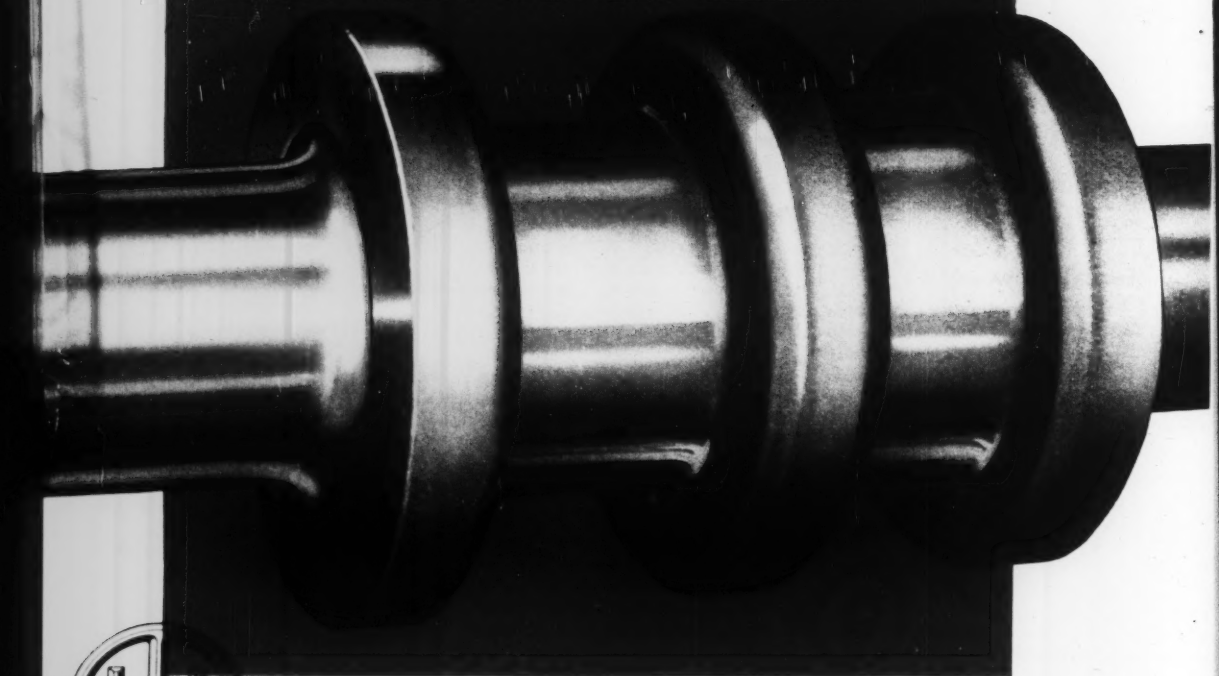


Ohio Rolls

SHAPING METAL FOR ALL INDUSTRY



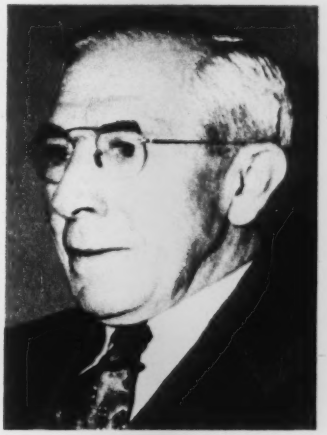
THE OHIO STEEL FOUNDRY CO.

LIMA, OHIO • PLANTS AT LIMA AND SPRINGFIELD, OHIO

Men of Industry

CLAUDE M. SHERIDAN
. . . Midvale development engineer

WILLIAM STAHLY
. . . mgr. of Armco's Tubing Div.



MICHAEL F. RYAN
. . . production mgr. at Yale & Towne

Midvale Co., Philadelphia, appointed **Claude M. Sheridan** development engineer in which position he is responsible for co-ordination of engineering, manufacturing and customer contacts on orders for special alloy products. Mr. Sheridan worked with Allegheny Ludlum Steel Corp. in manufacture of high alloy steels and was later with Atomic Power Division, Westinghouse Electric Corp.

Michael Pinto was named president of **Pioneer Engineering & Mfg. Co. Inc.**, Detroit. He succeeds **A. M. Sargent** who founded the company and served as its president since 1930. Mr. Pinto also heads Douglas Tool Co., Detroit. **Clyde Mooney** becomes general manager of Pioneer. He has served as chief engineer since 1945.

Harry L. Emerson was appointed president and general manager, Rockford Clutch Division, **Borg-Warner Corp.**, Chicago, to succeed **Arch A. Warner,** named president of the company's Mechanics Universal Joint Division. Mr. Emerson was formerly vice president-manufacturing with Rockford Clutch. Mr. Warner's predecessor was **G. C. Gridley,** who retires as president of the mechanics division but continues with the company in a consulting capacity.

William Stahly was appointed manager of **Armco Steel Corp.'s** Tubing Division at Piqua, O. He succeeds **S. E. Jackson** who resigned because of ill health. Mr. Stahly has been chief engineer and superintendent of maintenance of the division.

Micromatic Hone Corp. promoted **John E. G. Kline** to vice president in charge of process development and patents, and **Douglas T. Peden** to vice president in charge of research and experimental.

At **Shakeproof Division,** Illinois Tool Works, Elgin, Ill., **E. U. T. Berthelsen** and **K. C. MacKay** were made assistants to the vice president - manager. Mr. Berthelsen previously served as works manager. Mr. MacKay headed the budgetary control department and continues jurisdiction over all matters of pricing and priorities.

Pittsburgh Forgings Co., Coraopolis, Pa., appointed **C. F. Yoders** purchasing agent to succeed **M. D. West,** who was granted a leave of absence due to illness. Mr. Yoders will continue to direct steel procurement operations. **J. R. Handyside,** formerly buyer, was appointed assistant purchasing agent, and **W. C. Geesey,** assistant to Mr. Yoder, was promoted to manager of planning and scheduling.

Michael F. Ryan was made production manager for **Yale & Towne Mfg. Co.'s** Philadelphia plant. In addition, he continues responsible for outside subcontracting work.

Guy J. Coffey was elected president of **Chicago Pneumatic Tool Co.**, Chicago, to succeed the late **W. L. Lewis. H. A. Jackson** has been acting president since the death of Mr. Lewis last June. He continues as chairman and chief executive officer of the company.

Pacific Airmotive Corp., Burbank, Calif., elected as vice presidents **L. B. Littrell, H. Y. Finley** and **Arthur Williams.** Mr. Littrell will be in charge of the Chino and Burbank engine divisions. Mr. Williams is in charge of the eastern region.

James B. Black Jr. was promoted to manager of bar and semifinished products sales for **Columbia-Geneva Steel Division,** U. S. Steel Co., San Francisco. **Shane Lloyd-Butler** was made manager of plate and structural products sales.

Nesco Inc., Chicago, named **Robert Purcell** first vice president and treasurer and **Edward Shultz** vice president in charge of manufacturing. Mr. Shultz, formerly manager of the company's Jacksonville, Ill.,

plant, now succeeds **M. E. Maurer**, resigning effective Feb. 1.

General Machinery Division, **Allis-Chalmers Mfg. Co.**, Milwaukee, appointed **Wilbur F. Koester** manager, plant engineering department, and **Richard F. Thuma** superintendent, tools and maintenance section.

International Steel Co., Evansville, Ind., appointed **Arthur M. Simpson** general manager of its revolving door division. He was with Kawneer Co., Niles, Mich., where he served as vice president and general manager of its Kentucky plants, and also as director of research and product development.

C. T. Leeds Jr. joined **Coleman Engineering Co.**, Los Angeles, as assistant to the president.

O. L. Howland, manager of sales of **Metal & Thermit Corp.'s** welding division, has transferred his activities from East Chicago, Ind., to company headquarters in New York.

Reed-Prentice Corp., Worcester, Mass., appointed **Eric Brierley** sales engineer in its Cleveland branch sales office.

Donald M. Hesling, director of research and engineering, **Sealed Power Corp.**, Muskegon, Mich., was promoted to manager of manufacturing and engineering. He has been with the company since 1937.

PERRY T. EGBERT
. . . new president of American Locomotive

WILLIAM S. MORRIS
. . . exec. V. P., American Locomotive

American Locomotive Co., New York, elected **Perry T. Egbert** president and **William S. Morris** executive vice president. **Duncan W. Fraser** continues as chairman of the board. Mr. Egbert became vice president in 1944 and has been in charge of locomotive and ordnance division operations at Auburn and Schenectady, N. Y. Mr. Morris, also a vice president since 1944, has been in charge of sales.

Robert J. Ritchey was appointed assistant general sales manager, **Townsend Co.**, New Brighton, Pa. He has been director of the market development division, U. S. Steel Co. **David V. Johnson** was made assistant to the general sales manager. Prior to joining Townsend, Mr. Johnson was with Reo Motors Inc. as assistant sales manager, Lawn Mower Division.

Pittsburgh Steel Co., Pittsburgh, elected **John U. Anderson** vice president-finance, **Richard Hillman**, treasurer and **Robert E. Lauterbach**, secretary. Mr. Anderson was formerly vice president, secretary-treasurer.

J. S. Smith was appointed director of purchases and production planning, **Wagner Electric Corp.**, St. Louis. **H. S. Garrett** is purchasing agent and assistant purchasing agents are **J. V. Christman, M. W. Cox** and **E. B. Shanklin.**

At the Youngstown plant of **Republic Steel Corp., James McClintock** was named superintendent of the electric weld tube mills and **James W. Maughan** assistant superintendent; **Edward Weden Jr.** was named superintendent of continuous weld tube mills and **Eugene L. Kline** assistant superintendent; **Robert C. Johnston** was named superintendent of bessemer converters and **John F. Beale** assistant superintendent.

John Finn was appointed sales manager, **Drake Steel Supply Co.**, with headquarters in Los Angeles.

Lt. Comdr. G. A. Noerager, released to inactive duty by the Office of Naval Material, was ap-

DONALD M. HESLING
. . . mfg.-eng. manager at Sealed Power

ROBERT J. RITCHEY
. . . asst. gen. sales mgr. at Townsend

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pointed Washington manager, **Chase Brass & Copper Co.**, with which company he has spent 16 years.

Kenneth P. Lovdahl joins **National Lock Washer Co.**, Newark, N. J., as manager of its wire division. He previously was associated with Charter Wire Inc. as plant superintendent.

National Supply Co. appointed **A. A. Anderson** division sales manager with headquarters at Casper, Wyo. He succeeds **Robert D. Stottlemyer**, recently named assistant division manager.

Edwin K. Kintner was elected president of **General Gasket Co. Inc.**, Rochester, N. Y. He formerly operated United Heat Control Co., Chicago.

John G. Hall was appointed assistant plant manager of **National Lead Co.'s** MacIntyre development in Tahawus, N. Y., source of ilmenite. **A. J. McDonel** was named chief engineer.

John F. O'Connell was appointed a vice president of **Bechtel Corp.**, San Francisco.

National Bearing Division, American Brake Shoe Co., St. Louis, appointed **Albert L. Hunt** manager of industrial sales. He continues headquarters at St. Louis where he has been serving as general superintendent of foundries for the division.

Jerome H. Eigenberger was appointed district manager for the Milwaukee area of **DeWalt Inc.**, subsidiary of American Machine & Foundry Co.

J. M. Planten was appointed manager of plant engineering at the New York office of **Lester B. Knight & Associates.**

B. L. OWENS
. . . new position at Atkins Saw Div.

Atkins Saw Division, Indianapolis, Borg-Warner Corp., appointed **B. L. Owens** manager of industrial and mill sales. He was formerly in Chicago as manager of central district sales.

Dr. J. H. Bruun joined **Hooker Electrochemical Co.**, Niagara Falls, N. Y., as director of research. He has been with General Aniline & Film Corp. for the last ten years.

Hartley B. Brown resigned as general manager, merchandising and distribution, **Inland Steel Products Co.**, Chicago.

William E. Buchanan, president-treasurer, Appleton, Wis., Wire Works Inc., was elected a director of **Allis-Chalmers Mfg. Co.**, Milwaukee, filling a vacancy created by resignation of **Edmund Fitzgerald.**

Herbert T. Andrew was appointed a salesman in the Detroit territory of **Standard Pressed Steel Co.** He had been a buyer with Cross Co.

WYLIE BROWN
. . . chairman of Hydropress

Wylie Brown was elected a director and chairman of the board of **Hydropress Inc.**, New York. He retired last year as chairman of the board of Phelps Dodge Copper Products Corp., a company he headed for many years.

William S. Richardson was elected a director and executive vice president, **B. F. Goodrich Co.**, Akron. He also becomes a member of the executive committee.

Parker W. MacCarthy was made manager, jet engine section, electric appliance engineering department, **Westinghouse Electric Corp.'s** appliance division plant, Columbus, O.

Roderick L. Smith was appointed field engineer for **Norton Co.** in the Chicago territory and **Philip H. Threshie Jr.** for the Pacific Coast.

Robert Rasmussen was appointed controller of the Toledo, O., plants of **Doehler-Jarvis Corp.** succeeding **Lester B. Johnson.**

OBITUARIES . . .

John A. Ingwersen, 54, vice president in charge of distribution, **Armco Steel Corp.**, Middletown O., died Dec. 6 of coronary thrombosis. He was also a director of Sheffield Steel Corp., subsidiary of Armco.

Carl F. Unruh, 60, director of purchases for **Ford Motor Co.**, Dearborn, Mich., since 1949, and associated with the company for 36 years, died Dec. 4 of a heart attack.

William H. Klauer, 82, chairman of the board of **Klauer Mfg. Co.**, Dubuque, Iowa, died Dec. 2.

Dr. John L. Bray, 62, professor of metallurgy at Purdue University since 1923, died Dec. 6 in West Lafayette, Ind.

Emil Schaeffer, 64, chief engineer and technical manager, **Elizabeth Iron Works Inc.**, Greenlane Union, N. J., died Nov. 17.

C. H. Sayre, president, **Trayer Products Inc.**, Elmira, N. Y., died Dec. 3.

Gustav Hinz, 72, who founded and was president of **Midwest Die Casting Co.**, Milwaukee, died Dec. 6.

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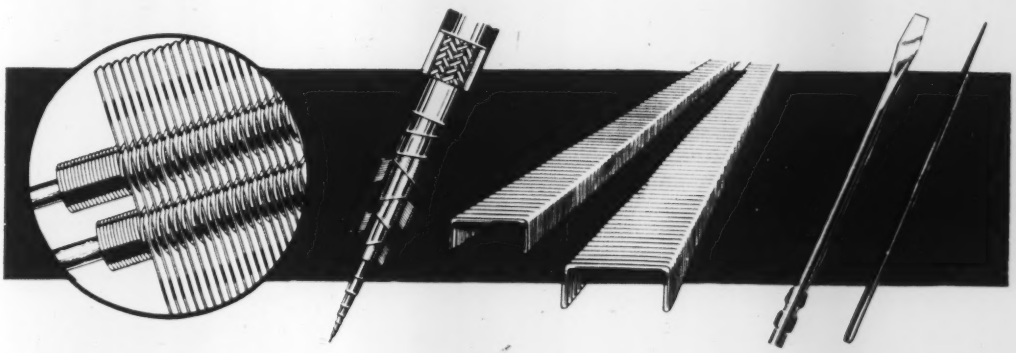

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Production AND Engineering
NEWS AT A GLANCE

DOING BIG JOB—Perhaps the 20th century's most spectacular engineering achievement, the automotive assembly line depends on the little fastener. Industrial Fasteners Institute points out that out of the 15,000 to 20,000 parts that go into the modern automobile, 2000 to 3000 are standard fasteners. It takes about twenty screws, for instance, to attach the inside windshield trim of a popular passenger car. In one particular type of screw General Motors requirements are in excess of 100 million per month.

BLASTING TOOLS—Longer cutting tool life results from the successful application of high velocity, wet blasting. In some cases more effective than hard chrome and less expensive, taps, reamers, broaches, twist drills, etc. last up to 8.5 times as long following pressure blasting with a fine, 5000 grit size abrasive. The method removes feather edges and blends directional sharpening lines. Microscopic etching of the tool surface also occurs which creates thousands of tiny oil wells for better lubrication retention.

FORGING TITANIUM—This most prominent of all the glamour metals doesn't behave like any other forging material. Knowledge of how the material acts under a wide variety of conditions will form a workable reference for future use. A bright spot in forging titanium is its resistance to cracking when being hot deformed. p. 104

COLD-JOINING—Low-heat requirement of new resin bonding agents is used to advantage in joining work-hardened materials and age hardened alloys. A soft heat-affected zone is avoided, such as might result in welding or brazing. Non-conducting properties are being applied in joining dissimilar metals, such as copper and aluminum, to avoid galvanic corrosion.

BORON GETS BIGGER—In the first nine months of this year the output of boron steels at 507,358 tons topped production for all 1951. Percentagewise, it jumped up to 9.2 per cent of total alloy steel other than stainless from 4 per cent in all 1951. Use of eight pounds of boron in a 150-ton heat of alloy steel saves a total of 4800 pounds of nickel, chromium and molybdenum, alloy materials that are in stringent supply in proportion to increased demand.

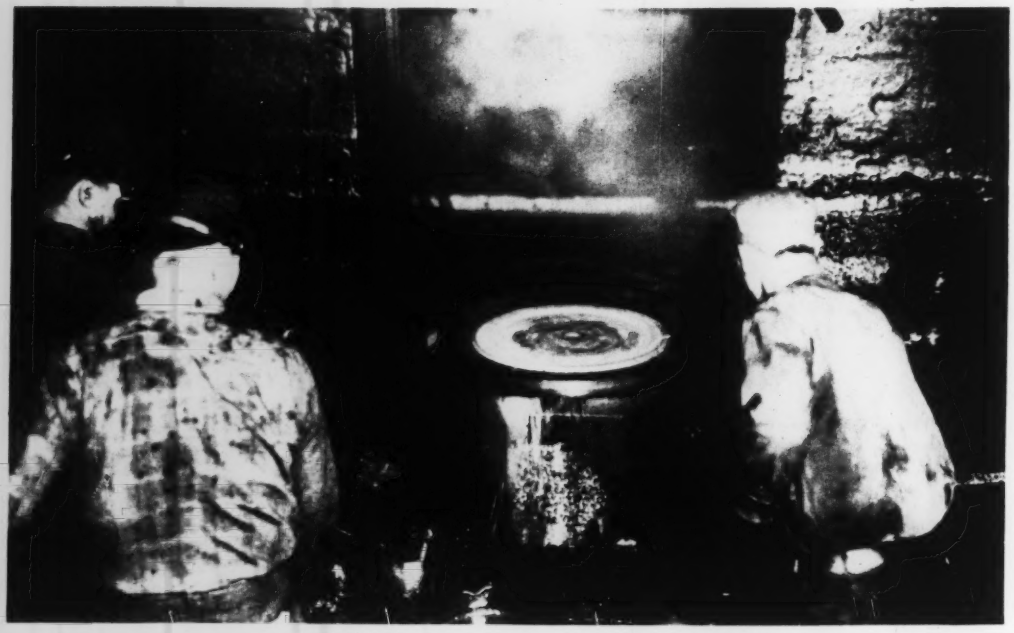
CUTTER COLLEGE—One of the best possible investments for any management to make is in the expansion of talent and knowledge in their own plant. In one case this can be done at very little expense. A five-day training program at Carboloy Department, General Electric Co., Detroit, is offered free. The only expense to the company sending a "student" is transportation and living expenses for the man. When the course is finished the trainee knows how carbide tool tips are made, what they will do and how to maintain them, and he has the word right from the source—the carbide maker. He's then equipped to return to the home plant and use his knowledge as a weapon for better production. p. 108

NO HEAT NEEDED—A new power washer is used at room temperature. Plants in hot areas are finding that the cold cleaner reduces working temperatures and makes condensers, vents and stacks unnecessary. Rusting is reduced and parts are cool enough to gage, inspect and move with bare hands. Savings of up to $150 a week in fuel costs and longer solution life are reported.

DOWN THE LINE—Mass production is most often associated with the large companies. This isn't a true picture altogether, however. Many of the subcontractors who furnish parts to the larger companies must also keep up with the heavy production schedules. In some cases this calls for production systems geared to the rapid output of the buyer. To set up a system like this and still retain a degree of versatility so different size parts can be handled with ease often takes real planning. When it's done the results can surprise everybody. p. 110

STATISTICAL SAVINGS—Republic Steel's director of quality control, Wade R. Weaver, reports the example of a steel company saving several thousand dollars per month in return for a few hours of quality analysis on a slight variation in the average silicon content of steel being manufactured into plates. At first the difference appeared insignificant but it was found that 40 per cent of the heats from one furnace were below the desired minimum on silicon but only 15 per cent from the other furnace. As a result of a change in deoxidation practice, the yield of slabs from ingots was increased 2.7 per cent.

SMOOTHER RIDE—Wheels that not only turn to negotiate curves but also move from side to side under the cab make the ride smoother for passengers. The experimental locomotive, a Westinghouse Baldwin unit, is an eight-axle, single unit locomotive powered by two 2000 hp gas turbines with an electric transmission. Running gear consists of four two-axle trucks with each of these trucks not only swiveling in the usual fashion when rounding a curve but also moving laterally under the locomotive cab. A roller carriage is attached to each truck and the engine cab rests on the four carriage rollers, permitting lateral motion.



Forging a titanium alloy compressor disk in a 20,000 pound steam drop hammer. A number of wheels are now being forged on a semiproduction basis

Titanium Forging Experience Mounts

Behavior isn't like that of other forging material but titanium pieces are being formed in a variety of sizes. Jobs are handled on various types of forming equipment

By R. J. BULLOCK
Development Engineer
Wyman-Gordon Co.
Worcester, Mass.

TITANIUM doesn't behave like any other forging material, rather it's a material with its own exclusive forging characteristics. A bright spot in forging titanium is its resistance to cracking when being hot deformed. There have been instances of surface defects, missed in conditioning the billets, opening up under the first hammer blows. Even though the multiples were given severe reductions after the opening of surface defects, cracks did not propagate.

Experience is accumulating that serves as a guide for future work. This experience goes back several years and companies like Wyman-Gordon have learned techniques enabling them to do jobs that formerly would have been extremely difficult.

First Job — About three years ago, we had our first opportunity to make a titanium alloy forging. The part was a large compressor wheel weighing approximately 200 pounds as forged. (A 200-pound titanium alloy wheel is the equivalent in volume of a 360-pound steel wheel.) The forging was 27½ inches in diameter with a 1-inch thick web, a 3-inch thick ring at the outside diameter, and a 3⅞-inch thick ring at the half radius. An integral test ring was incorporated in the finish forging design to provide for 100 per cent tensile testing of the forgings.

Material specified for the wheel forging was a Cr-Fe-Ti alloy. The supplier of this material had no facilities for converting the ingot material to wrought billet so we were required to accept an induction melted as-cast ingot. The ingots were cast in a carbon crucible which produced a very irregular hard layer on the outside of the ingot. Because of the surface defects, it was necessary to

remove ⅜-inch from the radius and both ends of the ingot. The rough outer layer was found to be particularly hard on tool life so a rough grinding operation was initiated preceding the turning operation.

Going Better—Removal of the outer skin by grinding increased the tool life and decreased machining time. In almost all cases the machining operation did not eliminate all of the surface defects. Etching and grinding was necessary to remove the local defects which were not removed in the machining operation. When the ingot was completely free of all visual defects, the forging operations were performed.

First step in converting the ingots to a finished wheel was to cog the ingot from its starting size of approximately 11-inch diameter to a bar of about 9-inch diameter by 19 inches long. The bar was then upset to a biscuit about 20 inches in diameter.

Heating of the ingot for the cogging and upsetting operation was done in a rotary hearth type furnace fired by oil. The cogging and upsetting was done on flat dies mounted in a 1500-ton hydraulic press.

Starting Point—In the first trial runs, runs were limited to two ingots. Being unfamiliar with the material, care was taken to limit the amount of reduction made with each squeeze of the press. As more experience was gained, it was possible to process ten ingots through the cogging and upsetting operation in the same set up, by drawing each ingot in one heat, reheating and upsetting after the reheat.

Biscuits after spot conditioning were ready for the hammer forging operations. Because of the geometry of the finished part, a blocking die was necessary. Both the blocking and finishing operations were performed in 20,000-pound steam drop hammers. The heating of the biscuits was done in rotary hearth furnaces. When up to heat, the biscuits were run through the blocking hammer, recharged into the furnace, and run through the finish operation and trimmed.

Approximately 75 wheels were forged before this experimental wheel program was completed. The

Titanium alloy compressor disk forging made on a 20,000 pound steam drop hammer. OD measures 20 inches

This small titanium alloy forging is made in a fast acting mechanical press and measures 5.5 inches

Good results were obtained on gear blanks forged on a No. 4 upsetting machine indicating method has promise

physical properties obtained from the integral test ring of one average forging were: Yield strength, (0.2 per cent offset) 114,300; ultimate strength, 128,300; per cent elongation, 8.0.

Better Raw Material — In the early wheel program, the number one problem was converting the cast ingots into a forging material. Today, the suppliers of titanium alloy are supplying sound billet material ready for forging without press or hammer preworking. At present, we are forging a number of wheels on a semiproduction basis. The wheels range in size from 20 to 25 inches in diameter and in weight from 80 pounds to 110 pounds.

Two principal alloys that are presently being used for the wheel programs are Ti-150-A alloy and Rem-Cru 130-B alloy. Both alloys are being processed in much the same manner. The material is being supplied as round cornered square or as turned round. The sizes most used are 9-inch diameter or 9-inch square. The cut multiples are heated at 1750 F for both alloys and forged directly in the hammer dies. Test results obtained in recent runs of both alloys have yielded good physical properties.

Size Spread — Wyman-Gordon hasn't limited the titanium forging program to the manufacture of large closed die forgings. Smaller forgings ranging in weight from 13 ounces to 18 pounds are being made on mechanical forging machines, upsetter machines, hydraulic presses and steam drop hammers ranging in size from 1000 to 5000 pounds.

One of the first experimental titanium small forgings made at the Worcester plant was an aircraft piston. The tools for this piston were designed for forging aluminum alloy forgings and used successfully in manufacturing thousands of aluminum alloy pistons.

Titanium alloy selected for this experiment was 6-inch diameter Ti-150-A alloy. Forging operations consisted of preblocking, blocking and finishing.

Heating of the material was accomplished in rotary hearth type furnaces controlled at 1650 F. The preblocking operation was made on an 800 ton single action hydraulic press. Both the blocking and finishing operations were forged in 5000-pound steam drop hammers. In the two hammer operations, the piece was forged over a plug which formed the inside diameter and wrist pin bosses of the piston. The draft angle on the plug of the blocker die was 5 degrees and the draft angle on the plug of the finish die 1 degree. In forging both the finish and blocking operations, the forging stuck on the plug.

Problem Arises—In addition to the sticking problem, a phenomenon known as "firing" occurred during the finish forging of one piston. Firing is local burning of the forging material presumably caused by friction between the work piece and the die block. Oftentimes this condition may cause the loss of the forging and irreparable damage to the dies. In the case of the piston, it was possible to grind out the fire mark in the die and in the piston and satisfactorily complete the forging operation.

An investigation of the feasibility of using slow acting hydraulic presses for the forging of titanium in contour dies was made. A relatively simple wheel forging $6\frac{3}{4}$ inches in diameter weighing 13 pounds with a cross section contour shaped like a dog bone was selected for the press forging investigation. For comparison, two wheels were made in a 3000-pound hammer and two wheels were made in the same dies mounted in a 1500-ton hydraulic press. The four multiples (two for the hammer and two for the press) were cut from the same heat of Ti-150-A material.

Variables Controlled—As nearly as possible, the processing of the press forged and hammer forged wheels were identical. Heating temperatures, heating cycles, die heating and die lubricant type and amount were controlled to reduce the variables and make an accurate comparison possible. The forging results were surprising. Superficially, the press forgings were better than the hammer forgings. A comparison of physical properties showed that the press forgings had higher yield and ultimate tensile values than the hammer forgings, and that the ductility values were about the same.

Small experimental forgings have been made in limited quantities in dies designed for steel forgings. Small shallow die impression forgings present no problem in hammer dies designed for steel. If the impression is deep and the draft angles on male plugs in the

die are not greater than 5 degrees, trouble with sticking on the die is very likely to occur.

Hot upsetting in mechanical upsetter machines looks very promising. A few gear forgings have been made on a No. 4 upsetting machine with good results.

Good and Bad—Titanium is a clean material with which to work. Unlike carbon and low alloy steels, titanium does not form a heavy scale when heated to forging temperatures. This eliminates the necessity of descaling before forging, and eliminates the scale pockets so prevalent in steel forgings. Titanium however does form a light scaled surface when heated to forging temperature.

Scale is a rust colored oxide which has abrasive qualities and is hard on machine tools. Titanium scale may very well reduce the life of die sets in production forging below the number of forgings expected of the same dies in forging steel. This is only a supposition since the number of titanium pieces forged to date in any given set of dies has been far too few to accurately prophesy die life. Another characteristic of the titanium scale is that it adheres to the die surfaces.

Forgings made in shallow impression dies have a smooth surface. If the die impression is irregular with extreme changes from shallow to deep pockets, a rough surface often results in the portion of the forging formed in the deep die cavities.

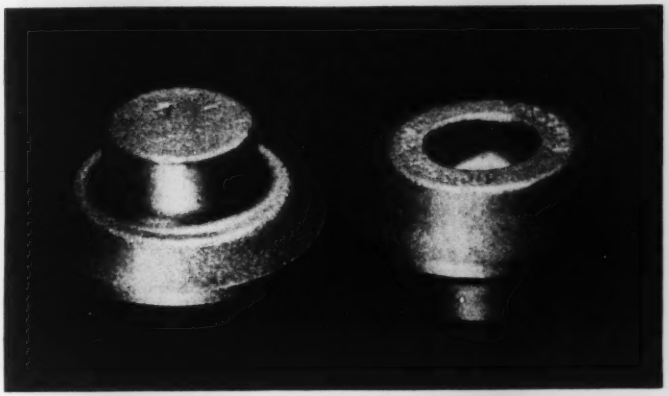
Shrinkage Differs—Just a word about the shrinkage of titanium forgings. Many customers request that a few titanium forgings be made in die sets designed for steel forgings. In many cases, we have produced these forgings on an experimental basis knowing that the forgings were to be used for investigation of the alloy. In production forging this would not be practical because of the difference in shrink between most common alloy steel forgings and titanium. This difference in shrink results in a $\frac{1}{8}$-inch per foot oversize condition in all directions on a titanium forging produced in dies designed for steel.

In almost all closed die forgings, there is an opening all around the die impression into a cavity called a gutter. This opening is called a flash. Its purpose is to provide a channel for forcing the excess forging material in the die impression out into the gutter to allow the dies to be brought down to the proper closure. The thickness of the flash in steel forging design is generally dictated by the size and the geometry of the forging.

This design practice holds true for titanium except that experience has indicated that for a given part, the flash thickness for titanium will be heavier than for the same part made as a steel forging. The reason for this is that the titanium flash as it cools in the relatively thin flash section tends to choke off the avenue of escape for the excess material resulting in a heavy forging in a plane normal to the die parting plane.

Another point to bear in mind is the problem of die heating. In large forgings approaching the capacity of the equipment being used, the working temperature range is quite narrow. Heating of the dies helps considerably in reducing the heat loss from workpiece into dies.

The resistance to deformation of titanium at a forging temperature of 1750°F is considerably greater than that of SAE 4340 steel at its forging temperature of 2250°F. Compressor wheels of both materials have been forged in the same dies and in the same equipment. SAE 4340 wheels were completed in far fewer hammer blows than were the titanium alloy wheels.



Small gear blanks also are being produced on fast acting mechanical forging presses. Samples are 3.5 inches

Sample of titanium alloy forging made on a 1000-pound drop hammer. Parts weigh from 13 ounces to 18 pounds

Customer School Trains Carbide Specialists

EDWARD ENGLISH is the New Britain setup man at Brabant Brass Mfg. Co., Detroit. He is also one of the more than 5400 people who in the last 15 years have taken the intensive course in use of cemented carbides conducted by Carboloy Department, General Electric Co., at its Detroit headquarters.

What Ed learned in that five days and passed on to his associates is summarized by James D. Brabant, production manager of the brass gas petcock and fittings manufacturing firm. Mr. Brabant says an amount equivalent to Ed's salary was saved in the first week after he returned from the course from economies realized in grinding procedures alone.

It's Easy—Mr. Brabant explains that the brass fitting company, a sixty-man operation, uses carbide tools in lathes, milling machines and automatic screw machines, but had always considered making these tools from standard blanks too specialized a job for its people to tackle until Ed returned and said: "It isn't too hard. Watch me." Now when the company needs carbide tools all the setup men know how to make exactly what's wanted.

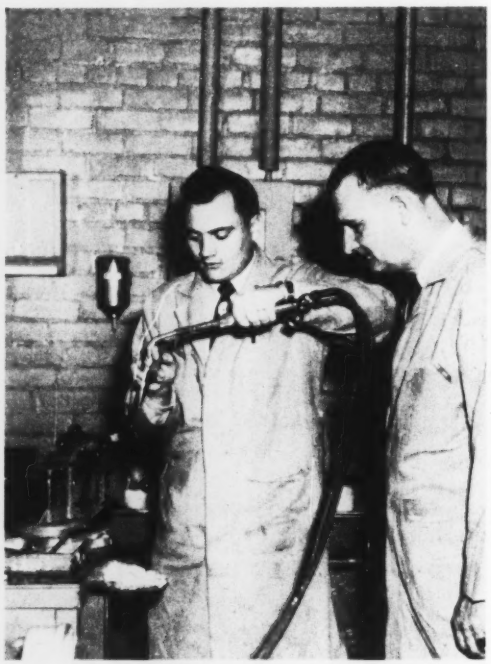
To find out how Carboloy's customer training program works STEEL and a camera followed Ed back to school and watched him and 13 other students in the cemented carbide cutting tools basic course.

Carbide College—The students are from all parts of the country. Their companies pay their transportation costs to Detroit and living expenses while there. They are not necessarily Carboloy customers; any user of cemented carbides is eligible for the course. Carboloy asks only that key supervisors be sent.

Basic course deals with five subjects: Single point carbide tool design; torch brazing; grinding; lathe and milling machine applications and trouble shooting; and tool handling. On the schedule are three types of instruction: Visual aids training films, charts and chalk talks; shop practice where each man has the opportunity to see the instructor do the job and then acquires proficiency in it himself; and finally classroom discussion where actual problems and experiences are aired and their solutions explored.

School is conducted under the direction of Robert G. Brierley in Carboloy's training department where four demonstration laboratories, a metal cutting laboratory, two discussion and conference rooms, and four instructors are provided.

1 Arriving early on Monday morning at Carboloy's headquarters plant Ed English will attend school for five days, learning how to design, make and apply cemented carbide tools to his company's operations . . .



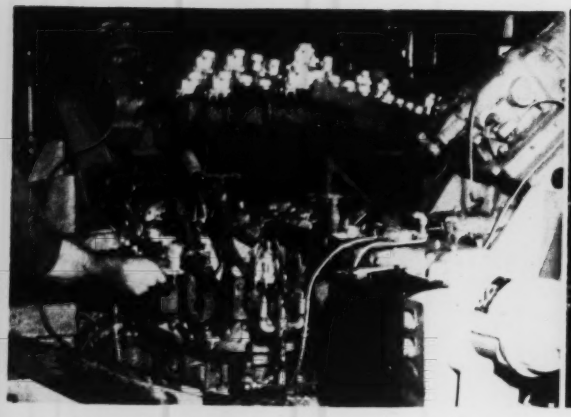
4 Having acquired the theory and fundamentals in classroom instruction the student observes a practical demonstration of the proper way to "wipe" the carbide tip by torch brazing. Next he will do the job himself . . .

2 Small groups of students are taken on a plant tour to familiarize them with the way in which cemented carbides are produced. Here they are watching a Carboloy workman check the temperature of a carburizing furnace . . .

3 Application of carbide tools in lathe work is demonstrated in this amphitheater by Instructor Ray Muessner, at the machine, and Paul Kunz, supervisor, Customer Training School. Feeds, speeds, chip breakers and interrupted cuts are explained . . .

5 After having received individual instruction, Ed learns by doing and gets the feel of working with carbides. Here he gets practical experience in finish grinding the rake and clearance angles on the single-point tool that he had previously brazed . . .

6 Back in the tool room of his own plant, Ed explains to James D. Brabant, production manager, how they can make and grind their own carbide tools from standard blanks effecting cost reductions and eliminating waiting for delivery



One of several multistation, indexing table machines used on carburetor air horns. Parts, unloaded by hand, go into chutes down which they slide to next machine

Loading machined and washed air horn castings on a belt. They're then carried through a Pangborn machine where a blast of ground walnut shells removes any fine burrs

MASS PRODUCTION:

But with an Eye on Versatility

Using a combination of automatic machines, this company has kept their production in step with heavy demand. The machines are versatile and are used on different parts

By HERBERT CHASE

MASS PRODUCTION methods of the large industries often extend into the plants of subcontractors and suppliers of component parts. Heavy demand must be met with heavy production.

Machining of zinc die castings for the Chevrolet carburetor consists of automatic and semiautomatic operations at Rochester Products Division, General Motors Corp., Rochester, N. Y.

Air horns for these carburetors are typical of one class of component required. These castings constitute the air inlet portion of the carburetors and each involves a short tube with a flange at one end.

Set for Machining — Castings coming from machines in the casting department are first passed through a trim press. It removes flash from the flange in a hand loaded die at the rate of 400 castings an hour. This makes the casting ready to pass through a series of machines each of which has several fixtures on an indexing table.

As each fixture stops at the loading station, a casting is unloaded and another loaded in its place by hand. Then the fixture passes through a series of stations. At each there is one or more Kingsbury or similar heads. These heads feed in the tools automatically to required depth and retract the tools as soon as cuts are completed.

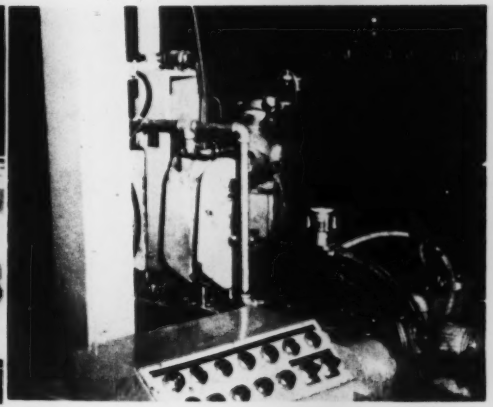
Down the Line—In the first indexing machine, which has seven working stations, various holes are drilled, spotted, chamfered and tapped. Second machine, having eight Kingbury heads, performs similar drilling, counterboring, tapping and reaming. A third machine drills and reams a cross hole, faces a center boss and does similar operations in a six-head machine. At the final machine of this type, air drilling is done from three directions, flash is broached from a pair of holes and line reaming, as well as some light air punching operations are performed.

Parts move from machine to machine down sloping slides or chutes in which the operators place them as they are unloaded from the fixtures.

These slides hold a moderate bank of parts—enough to keep the line operating for short periods even when one machine has to be stopped, as for tool replacement. Each operator always has a bank of parts ready for processing at his left and, at his right, chutes that take the parts to be unloaded to the next machine. Along this line the average rate of machining is between 200 and 300 castings an hour.

Quick Wash—At the final indexing machine, the castings are placed on a continuous wire belt that carries them through a hot wash of water and soluble oil in a Ransohof machine. At exit from this washer, the belt carries the castings through a gas flame set

Special chain-indexing machine performs a series of operations on six different small die castings. Single operator loads machine and inspects every 29th piece



Closeup of the loading station of the chain-indexing machine. Parts are loaded in the holding fixtures as they stop. Return of the chain is under the table

to apply just enough heat for rapid drying. This belt discharges dry parts adjacent to the loading end of the Pangborn deburring machine.

In this machine, fine burrs are knocked off by blasting jets of walnut meal made by grinding walnut shells. The meal is sufficiently abrasive to accomplish its purpose and still not have any detrimental effect upon machined or other surfaces. The blasting machine is hand-loaded but the castings drop into a chute as they leave the belt at the discharge end.

More Deburring—Castings coming from the chute are picked up by one of four girls seated at a bench. The bench is equipped with high speed air drills at four positions. Drills in these machines do almost no cutting but they do remove fine burrs in small holes and any others which were not removed by the blasting. Fixtures are not needed for this drilling.

Castings are held by hand and each operator must see that the drill or drills at her station are passed into certain specified holes before the casting is passed along. At the final station at this bench, there is a fixture where compressed air is applied to blow out any chips or foreign matter in the casting.

Straight Line Index—One of the smaller die castings machined is an automatic choke housing. The indexing type machine is quite different from the table indexing machines. All stations are along a chain that advances the fixtures in a straight line where they stop at eleven stations. At each station, (except for some left blank) there is a Dumore, Kingsbury or other automatic head equipped with a suitable tool that is fed to the work and then retracted automatically as soon as the required cut is completed.

Before each cut, the holding fixture stops and is automatically elevated a small amount by a hydraulic plunger that passes through a chain link. This lifts the holding fixture against the lower face of a mating fixed jig that guides the tool to be applied. Thus, correct location for the operations at each station is insured.

All at Once—Upon completion of the operation at each station, the holding fixture is released, lowered and advanced to the next station. All holding fixtures below corresponding jigs are elevated at one time, are similarly lowered, after the operation. They then are advanced one station.

At the final station, the work piece is released, picked off and then dropped into a chute. Fixtures that pass the final station continue to be advanced by the chain and are returned to the loading station, where they are reloaded for the next circuit. A total of 29 holding fixtures are needed but as 500 to 525 pieces are passed through the machine an hour and up to eleven operations are performed on each piece the high production rate fully warrants the tooling needed.

Versatility—Actually, six different castings are handled through this same machine. Each of these requires some alterations in the setup, tools and fixtures but the same heads are commonly used. Some do not carry tools if the total number of operations needed on the particular piece happens to be less than the number of heads. So the machine is remarkably versatile. Since the work is precisely located and tools are properly guided at each station the machine turns out quality work at production rates.

Sequence—This choke housing goes through the following sequence of operations: First a Dumore automatic drills a small angular hole. Next a Keller air drill produces an angle hole. In the third position a Locke automatic drill reams a piston hole. Stations four and five are idle. In number six a vertical Kingsbury taps three holes using a geared head. At the same time a slot is broached in a piston hole. In station seven another air cylinder reciprocates a nylon brush to clean chips from a hole. Stations eight and nine are also idle. Next a Locke head drills flash from a hole. In the last two positions compressed air blows off chips and an

air-operated pickoff removes the workpiece and drops it into a chute.

On other parts, such operations as shaft facing, chamfering and die threading are performed by this same machine. A sequence timer makes the machine function as required for a given part. A microswitch at each head stops the machine automatically if the head fails to function as intended.

Selective Inspection—Each 29th piece is returned automatically in its holding fixture to the operator. This is done so that the operator can check the piece to see that all operations have been done correctly. If any are not properly done, he stops the machine until the reason for the faulty operation is found and corrected. This avoids production of parts not up to specification without using a second man to do checking. The operator does not have to leave his seat to perform this inspection. He also has controls to stop the machine at any time if he notices any lapse in correct functioning.

Quality is not permitted to suffer because of the high production rates. All parts have to be held within limits. Inspection checks critical dimensions and also sees that quality and performance requirements are properly maintained.

Booklet Tables Tool Steels

A. Milne & Co., nationwide distributors of solid and hollow tool steels, has published a booklet of reference tables useful to tool engineers and metallurgists. The 8-page file-size booklet features a temperature conversion table of the Albert Sauveur type which simplifies fahrenheit to centigrade and centigrade to fahrenheit conversions. Also included are a hardness conversion table, convenient shop formulas for obtaining weights of steel bars, a table for determining weights of steel bars of various shapes in pounds per foot, and decimal and millimeter equivalents of fractions of an inch.

Copies may be obtained by request on company letterhead either to Milne's main office at 745 Washington St., New York 14, or to any of the company's offices in principal cities.

Capacity Doubled for Treating High-Lime Uranium Ores

New process for treating uranium ores is operating at the Uravan, Colo., mill of U.S. Vanadium Co. This Union Carbide & Carbon Corp. division has doubled capacity since August, 1951. At Uravan, the firm installed a process developed specially for treating high-lime uranium ores. Although these ores are abundant in Colorado Plateau area, lime content increased cost, limiting recovery

Moly Refinements Coming

GE metallurgist sees progress in coating, changes in fabricating techniques

TITANIUM alloys, boron steels and the general problem of reducing strategic elements in alloys were factors commanding the metallurgist's interest in 1952. This was the report on the year's work by J. D. Nisbet, manager, materials and processes section, metallurgy research department, General Electric Co., Schenectady, N. Y.

Another development was the rise of an older material, molybdenum, to a position as a possible base for stronger high-temperature alloys, says Mr. Nisbet. Due to its very high melting point, moly shows strength at temperatures up to 2000 F.

High Strength—Its alloys seem to promise as much strength at 2000 F as the highly alloyed cobalt and nickel-base alloys at 1500 F.

Mr. Nisbet reports gas turbine designers continue to call on metallurgists to develop stronger materials for use above 1500 F. Molybdenum-base alloys seem to be a good bet, provided some problems unique with them can be solved.

Moly has poor resistance to oxidation. This problem has yet to be solved by alloying. Progress is reported in coating the materials with glasses, ceramics and other metals for protection against oxidation, says Mr. Nisbet.

Changes in Technique—Molybdenum and molybdenum alloys must be fabricated at temperatures near and above the melting temperatures of iron. Therefore, says Mr. Nisbet, it is reasonable to expect great changes in fabrication techniques during the coming year.

Federal Catalogs Press Data

Complete details and illustrations of Federal's open back, inclinable presses are included in the 20-page catalog recently published by Federal Press Co., Elkhart, Ind.

Featured in the catalog are the new Smooth-Air clutch-brake mechanism and a new system of electro-pneumatic controls. Copies can be obtained by writing company headquarters.

Brake mechanism and improved controls are reported to permit smoother operation at speeds in excess of accepted press standards.

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Pickling vats heated by submerged burner at Creamer & Dunlop, Tulsa, Okla. Combustion chamber in foreground

Graphite burner about to be lowered into firing chamber. Combustion products are discharged through bottom port

Heating Pickle Liquor By Submerged Combustion

New type pickle liquor heater comprising graphite burner for direct firing of natural gas affords long life in corrosive solutions. High firing efficiency is maintained

By W. I. WEISMAN
Chemical Engineer
Ozark-Mahoning Co.
Tulsa, Okla.

A GRAPHITE burner firing natural gas in highly corrosive solutions now is being used for maintaining pickling baths at required temperatures. Essential components of a newly designed submerged combustion unit built by the Ozark-Mahoning Co., Tulsa, Okla., include:

1. A motor-driven blower or compressor to provide combustion air to the burner under the proper pressure to allow combustion to take place beneath the surface of the liquid.
2. The burner assembly proper, fabricated of graphite and equipped with an electrical ignition system and necessary safety devices in case of flame failure.
3. The tank or chamber holding the burner and the liquid being treated.
4. Control equipment consisting of a panel on which are mounted various gages, switches and instruments and the control valves in the lines regulating the flow of air and gas either manually or automatically.

How Bath Is Heated—The burner is placed in a special brick-lined chamber which is interconnected with the main pickling vat. Two connections are made to the pickling vessel, one near the bottom of the tank and the other near the top. With the burner in operation, the products of combustion are released directly into the solution. The transfer of heat is direct from the gas to the liquid and is rapid and complete, resulting in high thermal efficiency. At the same time the gases bubbling up through the restricted burner chamber create an air lift effect which sucks in the solution from the lower opening and causes the discharge of heated solution at the top opening. This action sets up a continuous flow within the vat which is a great aid in pickling various items particularly pipe. This circu-

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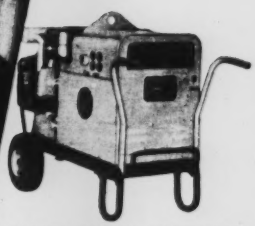

Arc Welder, made by Miller Electric Manufacturing Co., Appleton, Wis., uses STRESSPROOF in the generator shaft.

This 2¼" generator shaft, 19¾" long, must be drilled through its entire length, have both ends stepped down, and keyseated for 10¾". Ground accuracies are required for pressing on the armature. Drilling was a headache and the keyseating often resulted in severe warpage. It required two hours to finish one shaft.

Three different steels were tried before switching over to STRESSPROOF. When Ground and Polished STRESSPROOF was used, machining time was cut in half—one hour instead of two hours. Warpage was eliminated and the shaft itself was much stronger.

STRESSPROOF makes a better part at a lower cost.

STRESSPROOF has improved quality and lowered costs in hundreds of similar applications because of its unique combination of four qualities in-the-bar: (1) High Strength, double that of ordinary cold-finished shafting; (2) Machinability, fully 50% better than heat-treated alloys of the same strength; (3) Wearability, without case hardening; and (4) Minimum Warpage. STRESSPROOF is available in cold-drawn or ground and polished finish.

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lation also serves to maintain a uniform temperature throughout the pickling bath. The pickling tanks of a recent installation are 38 feet long, and the temperature difference in the liquor at the far end as compared to the liquor near the burner is 1 or 2° F.

The separate burner chamber at one end of the pickling tank has additional advantages. The tank itself is free of any heating coils or pipes and the entire area is available to accommodate the work. There is no danger of breakage or damage to the heating elements within the tank. The burner chamber can be covered and a vent duct provided to carry away the fumes and products of combustion.

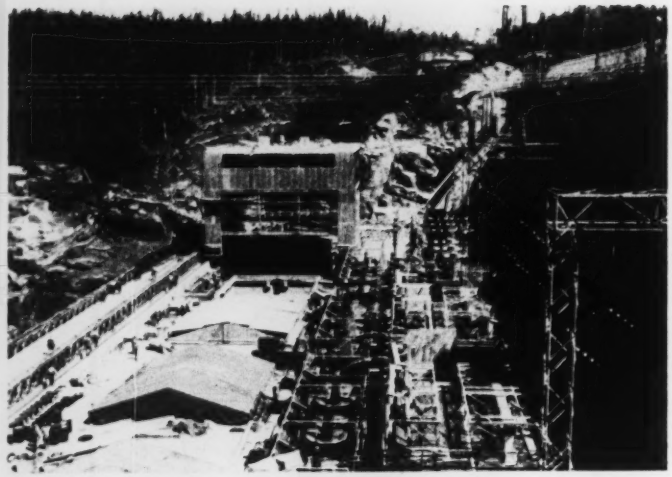
Where two pickling tanks are involved in an installation, each is provided with a separate burner and burner chamber. Both burners are served by one air compressor controlled from a single panel board. Air and gas are proportioned and mixed in a Bryant Flo-mixer before compression in a gas pump. The temperature of the pickle liquor is controlled manually by by-passing part of the air-gas mixture to the suction of the gas pump to reduce the heat release. While the cost of such an installation represents a minimum, greater flexibility is given to an installation if individual blowers are used for each burner.

Temperature Held Constant — Automatic controls can be provided to vary the flow of air-gas mixture to maintain a constant temperature in the pickling tank. While such controls add to the cost of the installation, more positive temperatures can be maintained and the operator need give the equipment attention at infrequent intervals.

A high thermal efficiency is attained because the products of combustion are discharged at a low temperature. Radiation losses are no greater when the bath is heated to a given temperature by submerged combustion than when heated by other means.

No water vapor is condensed in the vat under this principle of heating. On the contrary some water is evaporated and it may be necessary to add some occasionally to maintain the level for pickling. Hence, maximum untilization of the acid present is attained because of the absence of dilution effect.

The flow current setup throughout the pickling tank provides agitation and a scouring action on the surface of the steel and this results in rapid pickling action. A unit of this type built to maintain a certain volume of pickle liquor at the desired temperature may require several hours to bring the cold bath up to temperature but once the pickling temperature is reached little attention is required from the operator.



Alcoa Adds Power to Quebec Operations

Powerhouse and high-tension transformer section of Aluminum Co. of America's Chute-du-Diable hydroelectric development is seen under construction on the Peribonka river in eastern Quebec. This is the first of two power plants being built to harness the river, adding a combined total of about 500,000 hp to the 2 million hp that is employed for aluminum smelting operations in the district

Carbide Alloys Cataloged

Because of continued developments in the field of sintered carbides, Carmet Division, Allegheny Ludlum Steel Corp., Pittsburgh, has published the 13th edition of its catalog on various carbide alloys.

The 32-page brochure contains information on new production techniques as well as new applications of this hardest of known metals. General information is given on special grades for machining steels, cast iron, nonferrous and nonmetallics and for punches, dies and wear parts. Free copies of the new catalog are obtainable on request.

Wall Hand-Cleaners Pay Off

Increased productivity in their oil burner parts-machining department has resulted through installation of "hand-care stations" near production equipment, according to Wayne Home Equipment Co., Ft. Wayne, Ind.

Each station consists of a dispenser of Hammons waterless hand soap and a wall cabinet of paper towels. No water is used in cleaning the hands, so the installations are located as required. This eliminates washroom congestion and cuts time loss away from machines, the company says.

Armco Building Drain Pipe Mill

Construction of a new plant for the fabrication of corrugated metal pipe, both plain and asphalt coated, pipe arch, and fittings for both pipe and pipe arch, is announced by Armco Drainage & Metal Products Inc., Mansfield, Pa.

When complete in the spring of 1953, the plant will have about 25,000 sq ft of floor space. According to Armco officials, it will enable them to better serve the industrial and agricultural area of northern Pennsylvania and western New York.

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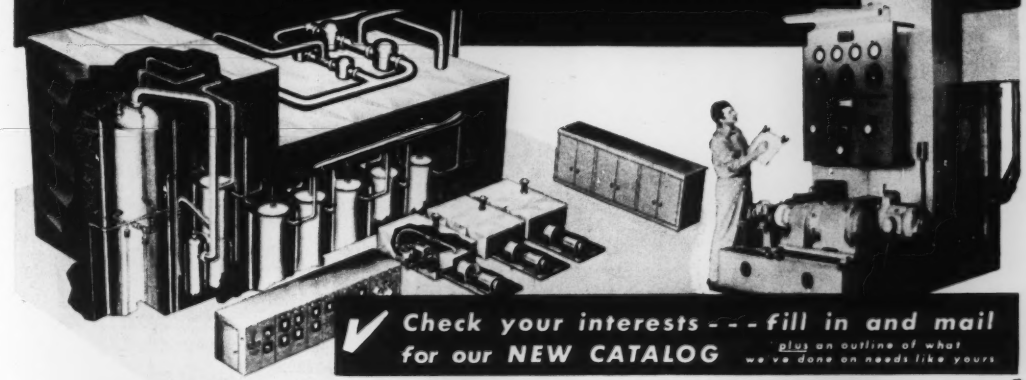

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- ☐ Scarfing
- ☐ Cutting
- ☐ Welding

NITROGEN USES:

- ☐ Annealing
- ☐ Heat treating
- ☐ Inert atmospheres
- ☐ Furnace brazing

Chemical Manufacturing, Processing

OXYGEN USES:

Production of Synthesis Gas for

- ☐ Ammonia
- ☐ Acetylene
- ☐ Methanol
- ☐ Other Chemicals (specify below)

NITROGEN USES:

- ☐ Ammonia synthesis
- ☐ Atmosphere control
- ☐ Nitrogen for use in drugs
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International Register of Chicago chose Udylite equipment to provide a tough, durable finish for vital fuse parts.

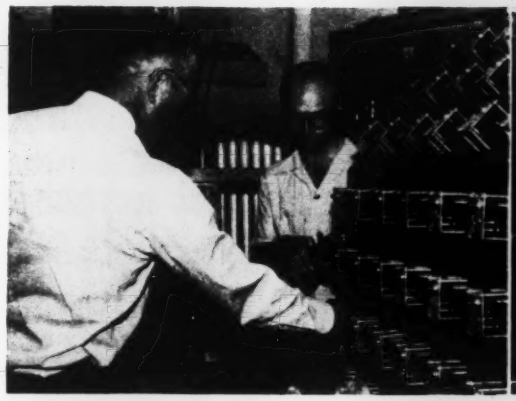
With Udylite equipment they're sure that finished fuse assemblies contain no rack marks or shadows. A special lift, which is part of the Udylite rack conveyor, raises racks clear of the plating solution so they may be easily turned.

Further proof of the effectiveness of Udylite processes and equipment is found in the fact that five other companies have ordered the same equipment to meet their requirements for similar jobs.

Udylite equipment can give *your* products the same uniform results. Call your Udylite representative today and let him show *you* Udylite short cuts to better plating. . . . or write The Udylite Corporation, Detroit 11, Michigan.

THE *Udylite* CORPORATION
DETROIT 11, MICHIGAN

PIONEER OF A BETTER WAY IN PLATING . . .



This panel is used in the study of complex motions. It makes it possible to vary factors that must be considered in planning efficient control panels for industry such as direction of hand motion, extent of motion, plane of motion and patterns of various motions required

Special adaptation of electronic methods makes it possible to measure each of many separate motions involved in industrial assembly work. Girl here assembles pins and washers on a plate with one hand—simulating what many small parts assemblers must do throughout industry

NEW TOOL FOR MOTION STUDIES

Electronics Helps Industry Planners

THERE'S nothing new in the fact that you can't teach an old dog new tricks, but University of Wisconsin psychologists are using electronics to find out why it's sometimes hard to teach new tricks to humans—and the findings may be of particular benefit to workers and planners in industry.

Under the direction of Prof. Karl U. Smith, psychologists Gerald Rubin, Robert Smader, Shelby Harris, and Richard Simon are making a scientific study of the various motions that go into simple and complex tasks, and electronic devices are saving them thousands of hours of time and millions of feet of motion picture film—the traditional tool used by scientists in the study of moving objects.

Thus far, methods have been devised to study the movements and position of the hand as it grasps and turns the knobs of a control panel, and as it performs assembly tasks and operates machines.

Subject Becomes Key—To make these studies possible the UW scientists invented a number of electrical devices in which a human subject acts as a key. As he conducts his assigned task, he opens and closes various electrical circuits which time each movement.

The electronic methods of motion analysis, says Prof. Smith, can be used to investigate the validity of principles of time-study used in industry. One of the important things so far discovered is that the same movement in different work situations is apt to take different periods of time—thus upsetting an old time-study rule of thumb.

The new electronic devices may be used for diagnosis of some neurological disorders, particularly those which have a destructive effect on hand or foot movement, Prof. Smith says.

Motion Analyzed — The motion analysis methods have also made it possible to study such problems of human motion as the effect of fatigue and interruptions upon individual movements in particular skills.

"Learning the motions involved in assembly tasks, in such things as tracking—like driving a car—and in operating machine controls is mainly an improvement of hand manipulation. The travel movements of transferring the hand from one place to another in these tasks are not improved much, if at all, by learning," Prof. Smith reports.

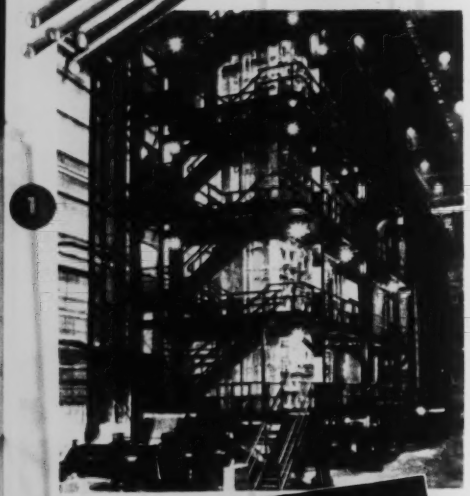
Experiments also show that learning does not actually result in the creation of any new relationships between the many movements required for a task—instead, each movement remains a kind of separate event even after long periods of practice.

Hand Action a Mystery — "In producing skilled movement, the human body acts like a many-channeled system, producing a variety of specific movements that have significance in the various tasks that must be performed," Smith says. "Although everything in the modern world depends upon skilled hand movements, there exists no systematic science of how the hand performs its skills."

Prof. Smith points out that

Improved product
Reduced finishing costs
Greater customer acceptance

Finished steel quality control is the goal of every Steel Maker. Steel finishing under precise atmosphere control is the answer. It assures premium quality at lower ultimate cost. Some applications of these "Surface" generators are described below.



BRIGHT ANNEALING, STRIP

1 — *Continuous bright annealing of strip*, for tin plating, is carried out at high speeds in this vertical strand furnace. NX or HNX atmosphere can be used.

2 — *Batch bright annealing of coiled strip* is accomplished in lift cover furnaces of the type shown. In this single row installation, NX protective atmosphere is used.

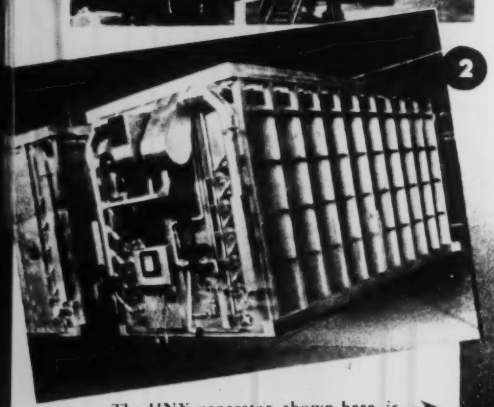
CARBON CORRECTION, BAR STOCK

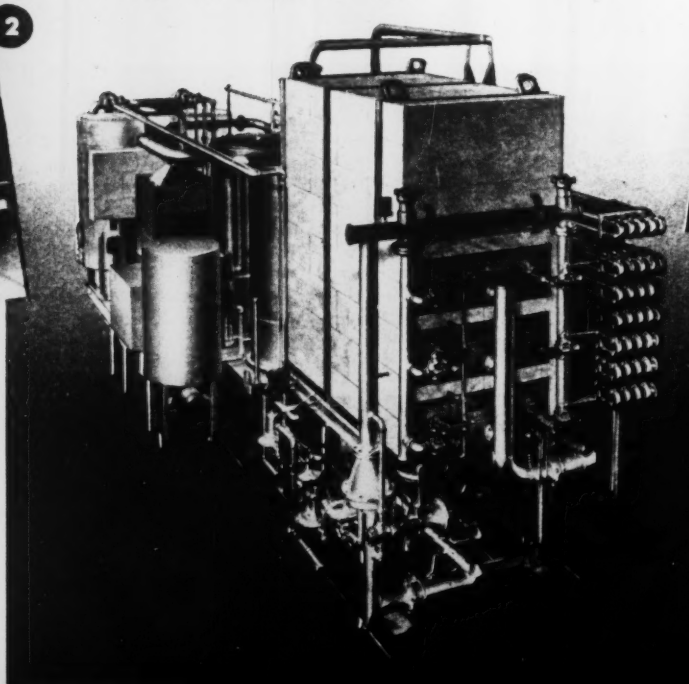
3 — *Batch carbon restoration* utilizes this lift cover, carbottom type furnace for simultaneous skin recovery and clean annealing. Here again, the reactive carbon medium is enriched RX atmosphere and the protective medium is NX atmosphere.

4 — *Continuous production carbon restoration of bar stock* is accomplished in this roller hearth furnace in conjunction with clean annealing. Enriched, RX atmosphere, is used as the carburizing medium and NX atmosphere for surface protection.

BRIGHT ANNEALING, SHEET

5 — *Continuous bright annealing of stainless clad sheet* in this disc hearth furnace with special rapid air quench chamber utilizes a protective atmosphere of DX gas.



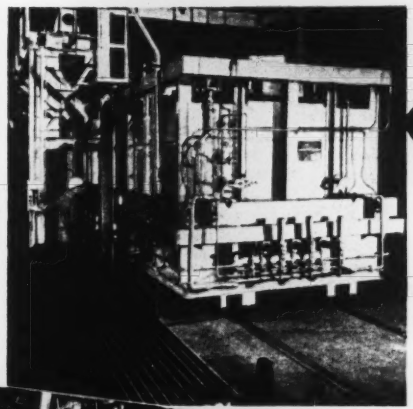


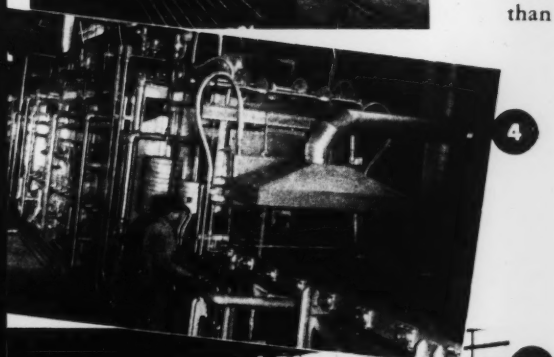
The HNX generator, shown here, is one of the five principal atmosphere generator types—RX, DX, NX, AX—built by Surface Combustion. They represent the engineering skill and 'know how' of 40 years standing in serving the nation's steelmakers. They make finished quality steel a practicality.

For complete information on the applications of these atmospheres, write for Bulletin SC-155.

YOU GET ALL 3 WITH *Surface*

CONTROLLED ATMOSPHERE





FURNACES AND GENERATORS

Controlled atmospheres have opened up endless possibilities throughout the Steel Industry for the safeguarding of product quality and increasing customer acceptance. Case carburizing...dry cyaniding...homogeneous carburizing . . . carbon restoration . . . clean hardening . . . bright or clean annealing . . . galvanizing . . . are among the important finishing operations, which come under its influence. These can be accomplished faster and with far better results using controlled atmospheres than by direct heating methods.

'*Surface*' has contributed materially to the success of controlled atmosphere in the Steel Industry. '*Surface*' Furnaces and Generators have given controlled atmosphere processes full production status at a time when increased tonnage plus an improved product are vital.

Into the design and construction of 'Surface' Controlled Atmosphere Furnaces and Generators have gone the best engineering talent available. Each atmosphere type has been developed to 'shoulder' a definite set of responsibilities in the treatment of steels (or non-ferrous metals) and to do its job well. Nothing has been overlooked to make 'Surface' the "buy word" in dependable controlled atmosphere equipment and its applications.

'*Surface*', acknowledged as a great name in the Steel Industry for over a quarter-of-a-century—with hundreds of successful Steel Mill installations to its credit—invites you to share in its experience and 'know how' in the interest of quality . . . an improved product at worthwhile savings.

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many persons have had the disturbing experience of changing from the old style gear shift to one on the steering shaft of modern cars.

"Motion analysis studies show there are strange effects when movements are transferred from one pattern to another. The interference effects of previous learning will carry over for long periods of time which probably accounts for the difficulties of teaching old dogs new tricks," Prof. Smith says.

Draw Press Uses Plastic Dies

Plastic draw dies were chosen for the initial test run of the 8000 ton Birdsboro triple-action draw press, in operation at the Lockheed Aircraft Co. plant in Burbank, Calif. Two Rezolin Tool-Plastik dies, drawing both outer and inner panels of a large door at the same time, were used.

The high cost of a metal die large enough to utilize the full capacity of this press is greatly reduced with low cost plastic and production engineers at Lockheed are confident that the plastic dies will make the press pay off in many ways.

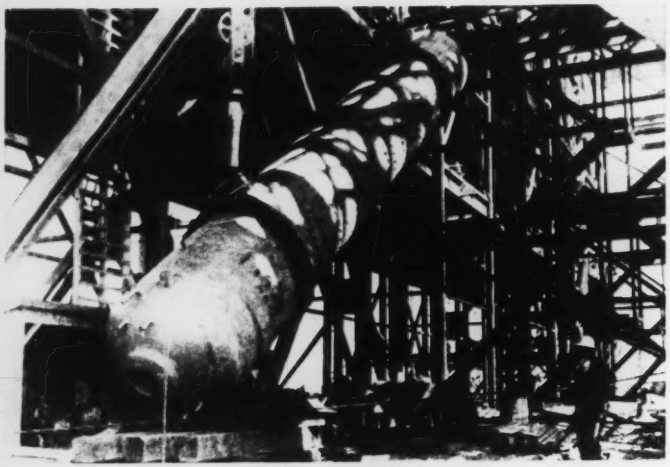
This deep draw press produces, from heavy gage aluminum alloys, parts in one piece to replace multiple parts previously assembled by meticulous riveting making possible substantial savings in fabrication time and assembly tooling.

Automatic Line For V-8 Engines

Pushbutton production line at Dodge Division of Chrysler Corp. is turning out the new 140-hp V-8 engine at the rate of 1000 per day, according to W. C. Newberg, president of Dodge.

When machine tool manufacturers deliver all additional equipment on order for this engine line, he said, it will have a capacity to handle 2400 engines per day.

In operation, the cylinder block is successively rammed through the three broaching machines and is automatically loaded, transferred, and turned 180 degrees between machines. A total of 1113 tungsten-carbide planer-type tool inserts are employed in the three machines. Each takes its cut on the block as it passes through. Initial line for the cylinder block consists of 20 pushbutton machines performing a total of 748 operations.



Parts Fall in Place for AEC Project

Steam generating units are being installed at Joppa Steam Station, Electric Energy Inc., Joppa, Ill., where they will furnish power for Atomic Energy Commission's Paducah, Ky., project. The drum being hoisted into place above for a Combustion Engineering-Superheater Inc. generator weighs 240,000 pounds, is 50 feet long and one section was rolled from plate 6-3 32 inches thick

Battelle Aids Research Abroad

Battelle Memorial Institute, Columbus, O., is establishing a research center at Frankfurt, Germany. This American research foundation is establishing another research center at Geneva, Switzerland, and has set up fellowships for selected students in the universities in both Switzerland and Germany. Additional research centers and fellowship programs for other countries of western Europe are contemplated for the future.

The Frankfurt research center, scheduled for completion by late spring of 1953, will engage in chemical, metallurgical and engineering research. The laboratory will cost about $1 million and another one-half million will be required to equip it.

Battelle's office in Geneva, Switzerland, has an engineering economics group working on industrial surveys. Laboratory facilities also are being established in that city and will be completed early next year.

Major purposes for launching Battelle in Europe are the economic betterment of the European economy through industrial research and the general advancement of science and technology on both sides of the Atlantic.

Time Short In Cash Contest

An award program open to resident engineering undergraduate students in the U. S. or Canada, including the service acadamies, is announced by Heli-Coil Corp., Danbury, Conn. Cash awards will be made for the most original or unique new uses for Heli-Coil thread inserts.

Award program period will end Dec. 31, 1952. Entries must contain a sketch of the design accompanied by short description. Awards of $1000, $500, $250 and $100 will be made.

ASTM Reworks Conductor Specs

Latest edition of American Society for Testing Materials standards on metallic electrical conductors, presenting the 46 ASTM standard and tentative specifications and methods of test pertaining to this field, is available from society headquarters in Philadelphia. Price is $3 per copy.

What's the $ Connection?

If there's a furnace operation in your setup . . . there's a mighty big connection between the CITIES SERVICE HEAT PROVER and your profit and loss picture.

Heat Prover—not an instrument you buy, but a service we supply—helps to increase furnace productivity through these five unique advantages:

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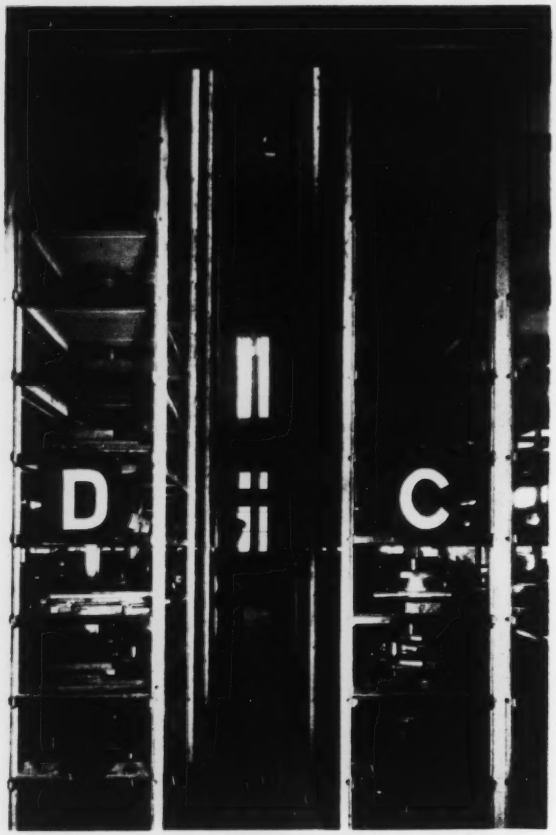
CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

Die Elevator Soothes Storage Headache

If you are looking for a solution to the die or jig and fixture storing problem, this "portable elevator" solution may be the one for you. With narrower aisles it gives maximum shelf space



Portable elevator permits narrow aisles in storage area. No room is needed for lift truck jockeying—more shelf space gained

MANY PLANTS are faced with the problem of storing dies, jigs and fixtures and other similar parts. Big problem is to have a place where they can be stored out of the way and at the same time be readily accessible for use.

American Stamping Co., Cleveland, had that problem and licked it with a die-storage system of their own design.

Pocket-Sized — Essentially it's nothing more than a series of open shelves. Each one is 23 inches deep and 52 inches wide. The aisles are only 29½-inches wide not nearly enough for maneuvering a lift truck.

Dies are lifted to the proper height on what actually is a portable elevator. There's one for each aisle. Power is supplied by a hand-operated electric overhead crane. The crane runs on an overhead rail which permits it to operate at any location in that aisle.

The elevator itself is an open metal-frame box with a platform bottom. There is a small wheel about 6 inches diameter at each of the eight corners. The wheels are grooved radially and are spaced on 52-inch centers.

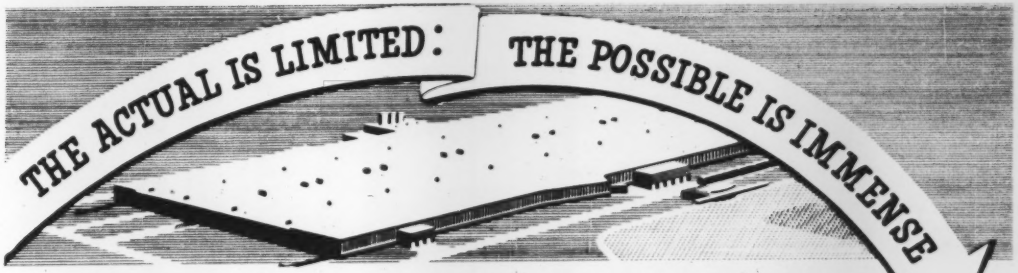
The Rails — Vertical structural members of the shelves are T-bars. They are spaced on 52-inch centers also and the exposed shank of the bar forms the vertical rail on which the wheels of the platform operate.

Axes of wheels are mounted on an eccentric. With a hand lever the operator can advance the wheels, locking them in position for engaging the T-bar rails, or he can retract them to move the elevator to any of the other vertical rows.

Thus, the elevator car is moved to the proper location in the aisleway and the wheels are locked properly into the T-runners. The die is rolled to the car on a special 4-caster truck and transferred to the car.

Electric hoist then lifts the car to the proper shelf level and the die is shoved off.

There is no jockying of lift trucks in tight areas. A maximum amount of the total storage area has been given to shelf space. Dies within the capacity of the overhead cranes are handled easily and quickly with little hand lifting or shoving.



NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

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WELDED STEEL DESIGN CUTS MANUFACTURING COSTS

. . . saves machining, simplifies production

MANY types and sizes of machine components can be produced more efficiently . . . with less material . . . at less cost through welded steel design. From heavy equipment like large presses (Fig. 1 & 2) to small machines (Fig. 3 & 4), proper design in welded steel saves materials, saves labor . . . cuts cost.

Material costs are less with welded steel designs because fewer pounds of metal are required on which less machining and less finishing is necessary. Products have better selling appeal with welded steel's modern appearance.

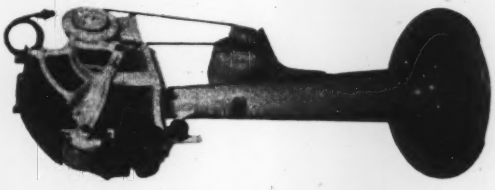


Fig. 4. Original Construction *of marking machine. Had high rejection rate in castings. Required considerable machining and finishing. Weighed 83 pounds.*

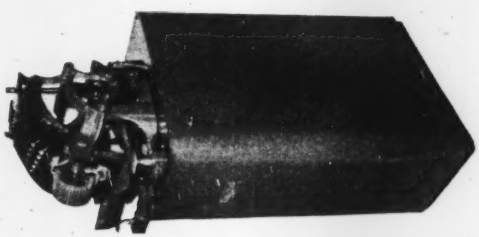


Fig. 3. Welded Design. *Cuts manufacturing cost 25%, weighs 33% less. Cabinet type base is now fabricated from 16 gauge metal and welded in simple fixture. Steel design eliminates entire cost of machining and handling originally required.* Courtesy National Marking Machine Company, Cincinnati, Ohio.

PROPER DESIGN IN WELDED STEEL IMPROVES PRODUCT AND LOWERS COST

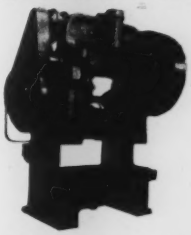


Fig. 1. Original Construction *of multiple punch press. Material cost was $.10 per pound from this manufacturer's own foundry. Weight was 56,000 pounds.*

INCREASES RIGIDITY SAVES MATERIAL

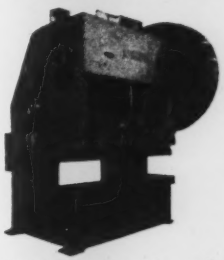


Fig. 2. Welded Steel Design *is actually more rigid than former casting yet weighs only 49,550 pounds. Modern in appearance . . . costs 15% less.* Courtesy Williams-White and Co., Moline, Illinois.

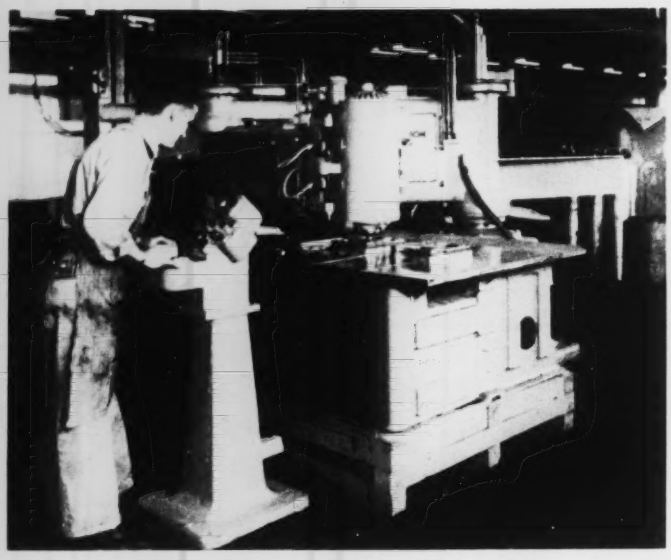
MORE PROOF

Machine Design Sheets available on request. Designers and Engineers write on your letterhead to Dept. 614.

THE LINCOLN ELECTRIC COMPANY

Cleveland 17, Ohio

THE WORLD'S LARGEST MANUFACTURER OF ARC WELDING EQUIPMENT



Operator guides the high-speed router around the template from a remote control panel. This 1-inch thick aluminum plate is cut in one pass. Cut can be taken on either an inside or an outside pattern in the template

High-Speed Router Is Remote Controlled

Machine takes much of the man-effort out of radial routing operations. Secret is the electrically-controlled hydraulic feed mechanism which guides the router

WHEN aircraft manufacturers started using tougher-cutting aluminum plate they created a problem for the operators of some of the hand-fed machines. Radial arm routers, for instance, had to be muscled around a template. Frequently the material was so thick that several passes had to be made.

Now Ekstrom, Carlson & Co., Rockford, Ill., has developed a radial-arm routing machine in which the feed is hydraulic and the muscles of the operator need only enough strength to push some buttons.

How It Works—Operator stands at a remote-control panel and with pushbuttons "tells" the routing head where to go. He has the general "on and off" buttons for the electrical and hydraulic systems. He has a "fast" and a "slow" set of buttons for varying the feed speed of the arms while the bit is in the cut. There's one marked "inside" and one marked "outside." These are for holding the follower against the template.

Operator also has a "down" and an "up" button for advancing and retracting the follower and the cutter. When he pushes the down button the follower advances and the operator puts it in contact with the edge of the template. There is a slight delay to permit this template contact and then the cutter plunges into the material.

Easy Street—From there on it's a matter of the operator pushing one of four direction buttons which are positioned in a circle and are 90 degrees apart. By pushing any one of these and a center button, he can throw the head into rapid traverse in that direction.

With a little skill the operator, by manipulating these four direction buttons, can send the router around the most intricate templates. He can cut through 1-inch aluminum plate in one pass and he does it at a uniform feed.

Spo To Make Shellmold Units

Spo Inc. and Shellmold & Machine Co. Inc., New York, announce completion of an agreement under which Spo's manufacturing and distribution facilities will become available to Shellmold for production and distribution of the latter's complete line of shellmolding machinery and auxiliary equipment.

Featured in this line and covered in the agreement are the new hand and air-operated types SU-H and SU-HP shellmolding units developed specifically to meet the average foundry's need for a production unit scaled to its operational requirements.

Included in the agreement, and therefore also available through Spo's facilities, is the automatic type SU-1 shellmolding machine, a single-station unit already in use in foundries producing stainless steel valves and a wide variety of other cast-metal parts for the automotive, farm implement and aircraft industries.

Computer Symposium Jan. 8-9

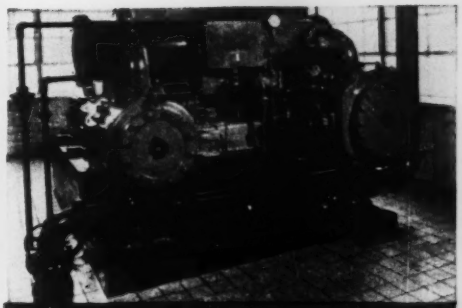
Importance of automatic computing equipment in industry will be the subject of a two-day symposium sponsored by Midwest Research Institute in co-operation with local sections of engineering societies in Kansas City, Mo., Jan. 8 and 9.

Representatives from industry, government and educational institutions throughout the country will attend the sessions to hear papers and discussions on operation of digital computers, analog computers, organization of computation centers, and application of computers to the various problems in industry.

Sodium-Uranium Beams Charted

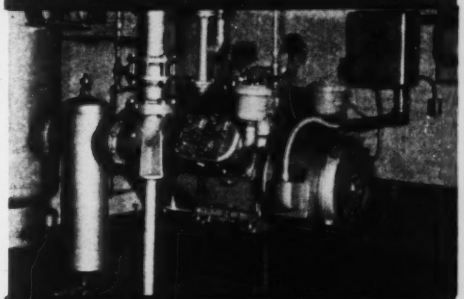
An x-ray spectrograph chart showing characteristic secondary x-ray beams for elements from sodium to uranium is availbale free of charge from Research & Control Instruments Division, North American Phillips Co., Mt. Vernon, N. Y.

USERS



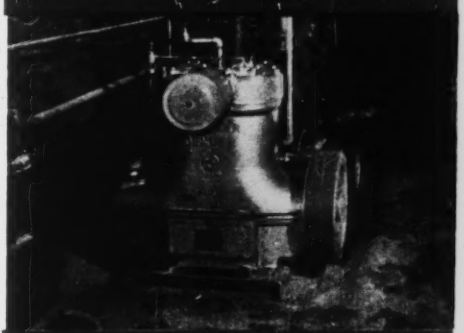
Master mechanic of a Pennsylvania processor tells of five years' experience with their HA. No service trouble whatsoever. In his opinion, the HA is "the best compressor made."

TELL



A Kansas City manufacturer has had a WB carrying his full air load almost 24 hours a day for several years. No overhaul required. Has replaced only a few small parts.

WHY



A manufacturer in Michigan reports he purchased an AA Compressor along with his present building. It's been supplying air for his operations for four years now, and hasn't been touched yet.

GARDNER-DENVER AIR COMPRESSORS

ARE SO OFTEN SELECTED FOR CONTINUOUS HEAVY-DUTY SERVICE IN MILL OR FACTORY. WRITE FOR DETAILS.

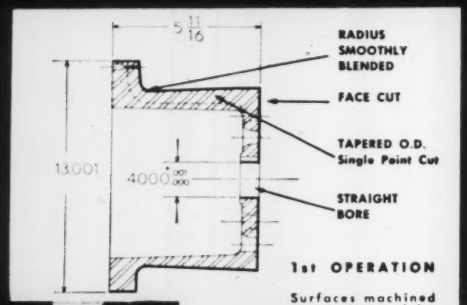
SINCE 1859 GARDNER-DENVER

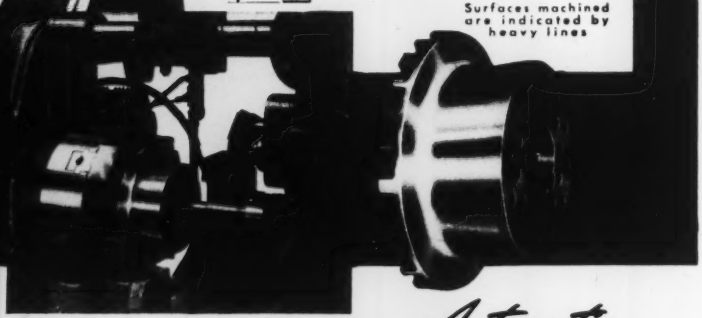
Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., Toronto, Ontario

THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS

DOING *Hard Jobs* THE *Easy Way*

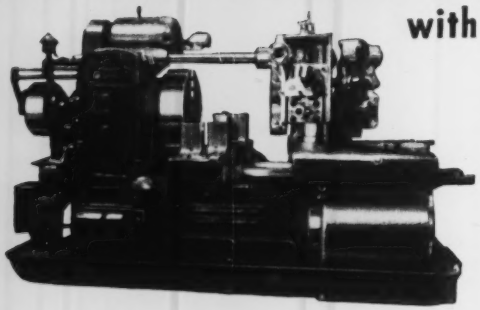
WITH SPEED.. PRECISION.. ECONOMY





calls for a

POTTER & JOHNSTON 6-DRE *Automatic Turret Lathe* with P & J TOOLING



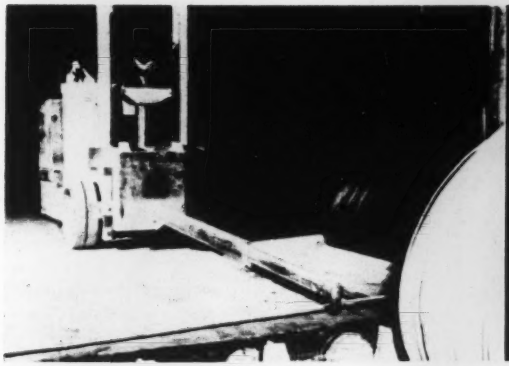
Skillful P & J Tooling on the powerful P & J 6-DRE Automatic is a combination that adds up to increased output with high precision and lower production and labor costs on every type of work. In the set-up for the **steel casting** job shown above, the overhead pilot bar is equipped with a cam that operates a slide tool on the turret to obtain the angle with a single-point cut.

If you'd like to turn out your hard-to-machine jobs faster and better with fewer rejects and greater profits — try doing them the P & J way. Just do this: (1) Write today on your company letterhead for your copy of Bulletin No. 148 that contains ideas for the profitable machining of forgings, castings and cut-off bar stock, and (2) Ask the experienced P & J Tooling Engineers to help you. They'll be glad to recommend the best possible combination of tooling and operation sequence. There is no obligation.

Precision Tooling Production for over 50 years

POTTER & JOHNSTON COMPANY
PAWTUCKET, RHODE ISLAND

SUBSIDIARY OF PRATT & WHITNEY — P&J — DIVISION NILES – BEMENT – POND CO.



At the conveyor, operator extends truck ram by hooking it on a spring-loaded cable, then reversing direction

With ram extended, truck can pick up wire in unit loads of seven or eight, weighing about 375 pounds per coil

Coil Handling Cost-Cutter

Collapsible ram assembly replaces standard forks on 4000-pound lift trucks. Result: Sizable reduction in wire coil handling time

WIRE COIL transfer from production to storage is a specific handling area where some concentrated work on refinement can produce a payff in time saving.

An eastern manufacturer developed a simple method for overcoming a transfer lag by equipping two 4000-pound capacity fork lift trucks with special handling attachments. Each attachment consists only of a collapsible ram assembly, extendable to 107½ inches, replacing the standard forks.

In the past, buggies loaded with wire coils were pushed mechanically through the baking ovens, then gravity-fed to the storage areas. Now, the two Yak trucks transfer coils from baking oven to storage area, requiring no more than 5 minutes for each complete cycle.

Upright Travel—Unit loads of coiled wire travel through the oven in an upright position on a conveyor belt. When they reach the belt-end retaining device, loads have a wire temperature of 400° F. Loads consist of seven or eight coils, weighing about 375 pounds per coil.

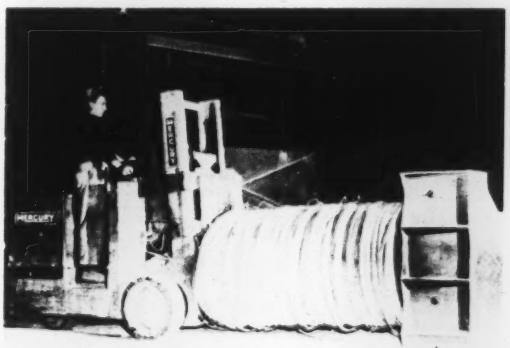
As the first step in loading and moving a cargo, operator moves his truck to the side of the conveyor where the hot coils are resting and hooks the ram onto a spring-loaded cable. As the truck is backed away it extends the ram to its full length. Spring-loading the cable prevents sudden over-stressing when the ram reaches its full length.

Sliding Member—With ram fully extended, the truck is maneuvered so its ram clears the conveyor and spears the coils. By raising the fork carriage assembly, the ram is lifted and coils clear the belt.

Ram assembly consists of a 3-7/16-inch diameter sliding member inside of a 71¼-inch long by 5-inch diameter main member.

Loaded and clear of the conveyor, the operator butts the ram into a specially constructed wood-lined steel column, collapsing the ram and compressing the load of coils. This not only reduces the ram length, making truck movement easier, but also reduces the inch-pound cantilever loading on the fork truck.

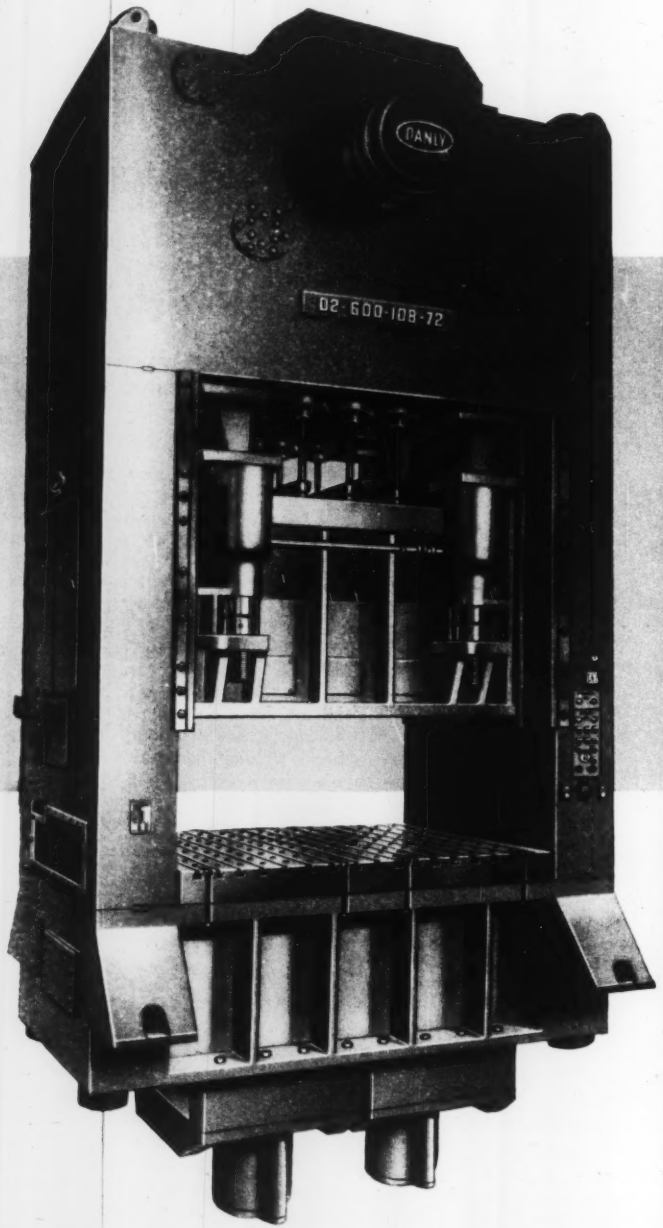
Added Dividend—The trucks, a product of Mercury Mfg. Co., Chicago, operate effectively enough under this coil handling system that they can be freed part-time for use in other capacities. One important function served by the lifts in this so-called free time places them on the job of prime movers during a part of each shift.



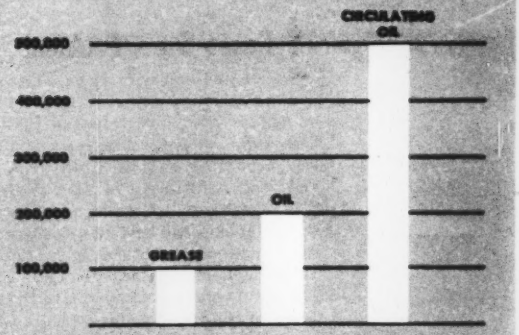
When ram clears conveyor it is butted against a column, compressing unit load, then truck moves away to storage

check your maintenance records!

DANLY



SAFEGUARDED BY AUTOMATIC OIL LUBRICATION
View of 600-ton Danly Double Action Press featuring automatic oil lubrication to all wear points. Pressure system permits automatic safeguards against lubrication failure.



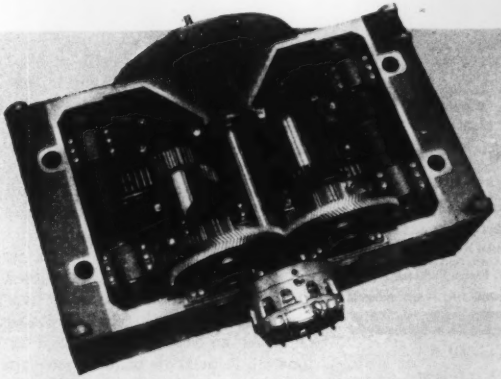
CIRCULATING OIL GIVES GREATER PROTECTION

Chart showing superiority of circulating oil lubrication for anti-friction bearings. Values at left represent bore of bearing in millimeters multiplied by speed in rpm . . . an accepted method for expressing limits of efficient bearing operation.

PRESSES

Actual day by day maintenance records in some of the country's biggest plants prove the importance of bearings in over-all press maintenance cost. The same records prove the cost advantages of Danly's automatic *circulating oil* lubrication system. Bearings wear longer because they run cooler and cleaner, continuously supplied with the proper amount of filtered oil lubrication.

Routine maintenance is reduced because periodic oiling or greasing is eliminated. The hazard of lubrication failure due to neglect or breakdown is eliminated by automatic safeguards. For the best in presses, come to DANLY.



CIRCULATING OIL TO ALL ANTI-FRICTION BEARINGS

Danly first and second intermediate shaft and drive shaft bearings, indicated in color in this exposed crown view are all anti-friction type, lubricated by filtered circulating oil. Cooler, cleaner operation prolongs life.

DANLY

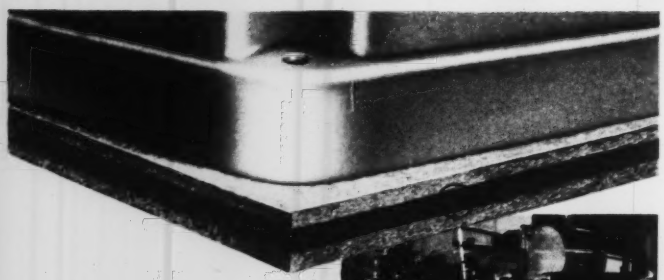
MECHANICAL PRESSES . . . 50 to 3000 TONS
HYDRAULIC METALWORKING EQUIPMENT

For complete details on outstanding Danly Press features . . . construction, drive, lubrication or operation . . . send for the Double Action Press Catalog today! Danly engineers are at your service.

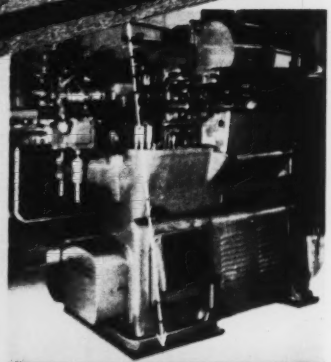
DANLY MACHINE SPECIALTIES, INC.
2100 South Laramie Avenue, Chicago 50, Illinois

It costs less to run a DANLY PRESS!

Single Action Straight Side | Autofeed | Underdrive Single, Double Triple Action | Gap Frame | Double Action Straight Side



Reduce VIBRATION
Eliminate FLOOR DRILLING
by mounting your machinery on



Brown & Sharpe Model 00-G Screw Machine mounted on UNISORB at Telechron, Inc., Worcester, Mass.

UNISORB®

Old-fashioned bolt-and-lag-screw methods of machine mounting . . . costly, inefficient . . . are *gone for good* when you mount machinery on UNISORB.

What's more, by eliminating 60-85% of transmitted vibration and noise, UNISORB prolongs life of machinery, building and floors . . . improves worker morale and efficiency . . . often permits higher machine speeds and increased production.

We supply a special cement that securely bonds UNISORB pads to machine feet and floor with a holding strength of at least 90 lbs. per square inch.

UNISORB is also available pre-coated with adhesive, but is not recommended for use with machines that require shimming.

You Reduce VIBRATION NOISE MAINTENANCE

with UNISORB Mountings

- no bolts, no lag screws, no holes to be drilled, no floor damage
- Felters adhesive holds for keeps, yet permits re-positioning of machines. (Our UNISORB Booklet tells you how.)

LOOK FOR THE RED CENTER AND UNISORB BRAND MARK

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TV Poses Steel Problem

ONE of the most complex challenges to steelmaking techniques is met in manufacturing the picture tube of a modern television set, according to American Iron and Steel Institute. The steel wall of the tube, which has the glass screen at one end and the cathode ray source at the other, is an example of how steel scientists modify and adapt their products to the needs of their customers.

By control of the steel's chemical composition in the electric furnace, metallurgists have developed stainless and alloy steels that expand and contract at almost the same rate as glass. When the coated glass that forms the picture "screen" of a television tube is bonded, by heat, to the steel walls of the tube, both glass and steel expand at nearly the same rate.

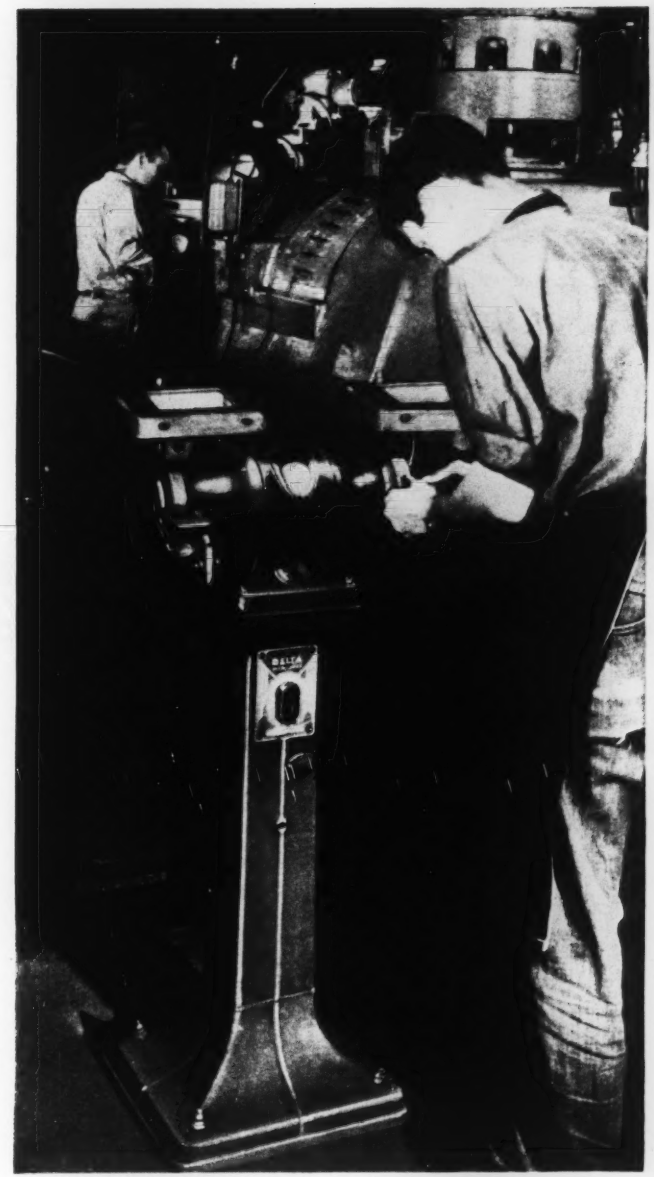
Similar Cooling — The materials also cool at a similar rate after they are sealed together into an airtight vacuum tube.

The steelmaker's skill extends to the forming and shaping of the wall for a television tube. A disk of steel is spun over a mold that is shaped like a cone with the point cut off. As the metal and mold spin, a special tool forces the steel down over the cone, thus forming it. The tool also squeezes the steel against the mold, reducing it in thickness at certain points, leaving it somewhat thicker where extra strength is needed.

Slag Waste No Longer Wasted

For a material that once was a waste and disposal problem, blast furnace slag, containing the unwanted elements of ironmaking, now has a wide variety of uses, American Iron and Steel Institute reports. Of the estimated 39 million tons produced in 1951 about 29 million tons was processed and sold by 43 companies.

Treated either by cooling in air or water, the primary processed variety is used in concrete construction ranging from building columns to explosive storage igloos. It is used in bituminous construction of all types for highway and airport construction and for railroad ballast. Further, it is the principal source of raw material



A Delta Carbide Tool Grinder *stationed at the tool* keeps tool bits sharp—reduces "down-time", boosts output.

Put DELTA TOOL GRINDERS Beside Production Machines and Cut Down-Time

How Edward Valves, Inc. does it—

Delta Tool Grinders permanently located along side of automatic screw machines, engine lathes, boring mills and turret lathes, enable Edward Valves machine operators to keep tool points constantly sharp.

Benefits: *less down-time, piece-rate operators have incentive to keep tools sharp, no time wasted between production machines and tool-sharpening room, smaller inventories of cutting tools, fewer tool replacements.*

Another Delta Grinder serves as a "utility man"—mounted on a skid, it is moved by lift truck from one machine to another or to other departments, wherever the pressure is on; plugs into the regular 110-volt lighting circuit; is used for deburring in addition to tool sharpening.

More Delta Tool Grinders are used in the tool sharpening room: and still others in the tool room for new tool production. This kind of production common-sense suggests that the same substantial savings may easily be yours for the taking. Why not survey your own tool-sharpening practices? A good first step is to contact your Delta dealer—he's a trained counselor on just such problems. Call him now.

There's a Delta Power Tool for Your Job— WOOD OR METAL WORKING — 53 Machines — 246 Models — More than 1300 Accessories

DELTA MILWAUKEE

DELTA POWER TOOLS Another Rockwell Product

Rockwell DELTA POWER TOOL DIVISION MANUFACTURING COMPANY

638P NORTH LEXINGTON AVENUE • PITTSBURGH 8, PENNSYLVANIA

Jenny doesn't live here any more!

YES, in the modern coal mine there's no room for Jenny. Today her job is done by powerful electric locomotives capable of pulling 50 times the load Jenny used to haul to the mine surface.

As a matter of fact, in the modern mine even the traditional pick and shovel are as out-of-place as Jenny herself! More than 90% of *bituminous* coal is now mechanically cut, and over 70% is mechanically loaded. Result: more economical coal to light the way, fuel the fires, power the progress of America.

But, basically, what caused Jenny to disappear? What's behind American industry's ever-more efficient machines that turn out goods at lower cost—thus making them available to more people? One word tells the story—COMPETITION.

In the coal industry there are 5,000 privately managed coal companies competing with one another and all competing in the market with other fuels. When one coal company develops more efficient mining methods, the rest can keep pace only by striving to improve even further. No wonder that with his modern machines, developed through competition, the American miner's daily output is 4 to 24 times that of any miner in Europe or Asia—most of whom work in government-controlled coal industries.

Just as competition spurs *you* on to trying harder—it's competition that goads the individual company to deliver products that will outsell others. And it's competition that keeps a whole industry on its toes, cutting distribution costs, opening up new outlets, and delivering better products.

Competition—not government control—has already made America the most productive nation on earth. Competition—not regimentation—points the way to ever greater plenty for all of us.

★ ★ ★

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THE COMPETITIVE SYSTEM DELIVERS THE MOST TO THE GREATEST NUMBER OF PEOPLE

in the manufacture of mineral wool, and also serves as the filtering medium in sewage disposal plants.

Research Coins Sales Dollars

Research is ringing up an ever-increasing number of sales dollars on the cash registers of industry, Dr. Charles N. Kimball, president of Midwest Research Institute, told trustees of the organization at their eighth annual meeting in Kansas City, Mo., recently.

Kimball cited examples in institute activity which are showing up for clients on the profit side of the corporate ledger. "During the past year," he said, "the technical staff has developed a wide variety of new products, including insecticides and herbicides."

Additional industrial developments include food products, waxes from crude petroleum, temperature controls, scientific equipment for use in hospitals, and materials for home and factory construction.

These programs were among the 265 projects for 156 different clients which accounted for research expenditures in 1952 of nearly a million and a quarter dollars.

IHF Sparks Anti-Noise Work

Recognizing the importance and seriousness of the problem of noise in industry and the need for action, representatives of numerous groups have asked Industrial Hygiene Foundation to co-ordinate a program to provide useful information for developing practical control measures and regulations.

IHF claims that the measurement of hearing loss and the interpretation of the findings in terms of potential recovery and permanent effects, as well as differential diagnosis, also need thorough investigation.

Paint Spray School Scheduled

Applications for enrollment in the week-long classes in industrial spray finishing methods are being accepted by DeVilbiss Co., Toledo, for its first-half schedule of courses in 1953.

Held in modern school headquarters adjacent to the main plant at Toledo, the courses will be offered six times, starting Jan. 12, Feb. 9, March 16, April 13, May 18 and

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IRIDITE
FINISHES
for zinc, cadmium, aluminum and cuprous metals
provide
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And they are easy to apply! Just a simple chemical dip for only a few seconds produces the coating.
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combine to make Iridite the most economical chromate finish you can buy. Many Iridite chemicals are packed in powder form, thus can be shipped to you in steel pails at freight savings of up to 75%! Pails take less storage space, are easier to handle, eliminate carboys, need not be returned.
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NEW
from SKF
the HESS-BRIGHT "SY"
UNIT PILLOW BLOCK
A new Unit Pillow Block, designed by SKF,
to meet tomorrow's needs of modern industry.
Here are the design features:
● SKF Red Seal, made of DuPont Fairprene, retains lubricant. Wiping action of the seal against the inner ring is practically frictionless.
● Rotating flingers exclude dirt.
● Set screws for ease of installation.
● Spherical outer ring compensates for initial misalignment.
● Alemite fitting for re-lubrication.
● Interchangeability with existing installations made possible by bolt hole spacing and center height features.
● Shaft diameters 1 3/16" to 2 15/16".

NEW
NEW
HESS-BRIGHT
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Hess-Bright
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Blocks
From now on, the name to remember in Unit Pillow Blocks is HESS-BRIGHT "SY"—manufactured in our plants, to the same high quality standards as all SKF products. Ask your SKF Distributor to show you the HESS-BRIGHT "SY"; or write SKF direct for complete information on this *newest* Unit Pillow Block.
SKF INDUSTRIES, INC., Phila. 32, Pa.
—*manufacturers of* SKF *and* HESS-BRIGHT *bearings.*
SKF
BALL AND ROLLER BEARINGS
IN EVERY INDUSTRY,

June 22. There is no charge for attending the school.

Plastic Market Problems Aired

Market quality vinyl products was the theme of a two-day meeting of Plastics Film, Sheeting and Coated Fabrics Division, Society of the Plastics Industry Inc., held in New York, Dec. 4 and 5.

One of the featured speakers was Dr. Roy K. Marshall, who demonstrated methods of comparing quality and inferior vinyl products.

AEC Steel Scrap Isn't Hot

Tests prove contaminated scrap is ok for reprocessing. Most radioactivity removed in slag

SCRAP STEEL contaminated with natural uranium is being released by the Atomic Energy Commission into commercial scrap channels as a result of a study which indicates that neither health nor technical hazards will result from processing of contaminated scrap by the steel industry.

Conducted by the Health and Safety Division of the AEC's New York operations office, the study was prompted by the national need for scrap, plus the cost of either shipping scrap materials for purification or of handling them as unrecoverable waste.

Not Harmful — The study revealed that average uranium concentration in steel produced with steel scrap from uranium production plants was less than 10 times that in steel produced with normal scrap. This amount is not considered significant in terms of either health or industrial hazards.

As expected, it was found that almost all of the uranium contaminant was removed from the steel with the slag. All of the scrap used in the study was either sheet metal or shapes, and no containers or pipes that might contain uranium caked materials were included.

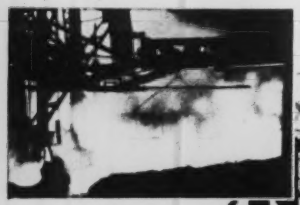
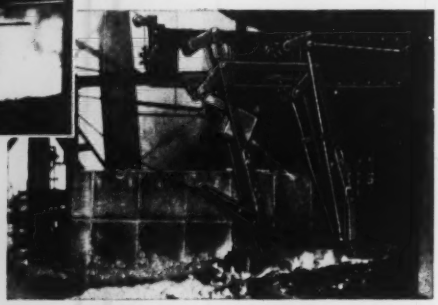
Further Dilution—Under average steel plant conditions the amount of contaminant in the finished product would be further reduced by the dilution of contaminated scrap with uncontaminated scrap. Even if it made up the entire scrap content, there is only about $\frac{1}{4}$-ton of scrap per finished ton of steel.

An attempt to produce a radioautograph by placing the finished steel sample having the highest uranium content against a panchromatic photographic emulsion was unsuccessful. No fogging of the film was observed after exposure of one week. On the basis of these findings, the New York operations office has already released 1100 tons of contaminated scrap.

Firm Builds Students' Motors

Electrical engineering students at Case Institute of Technology, Cleveland, next February will have the opportunity to enroll in a new motor design course wherein their own design will actually be incorporated into manufactured motors.

Under the plan, small groups of students will work together in designing motors from one to 7½ hp. Their specifications will then be sent to Robbins & Meyers Inc., Springfield, O., where the motors will be built at no charge. Completed motors will be shipped back to Case to be added to the regular laboratory equipment.

The Bailey

CINDER NOTCH STOPPER

for Safe, SURE CLOSING

- Absolute safety while inserting or withdrawing
- Adaptable to any cinder notch
- Same mechanism inserts and removes bottor
- True alignment with cinder notch at all times
- Water-cooled cinder bott and rod
- Bottor rod when withdrawn is well above trough

No workman need enter the danger zone to close blast furnace cinder notches, since all controls of this service-proved device are located in a remote position. Using a unique gravity action for inserting the bott in the monkey, it employs air or steam power action only for withdrawal.

In operation, an air or steam powered cylinder withdraws stopper to the "out" position, with a latch locking the bott rod in position during the flush. A tag line is used to release the latch, with gravity action immediately inserting the bott in the monkey. For over 20 years the Bailey Cinder Notch Stopper has been known for dependability and safety throughout the steel industry.

WILLIAM M. Bailey COMPANY
ENGINEERS
LEADERSHIP THROUGH QUALITY
1221 BANKSVILLE ROAD — PITTSBURGH 16, PA.

Cycling 700 shots per hour

WITH OIL TEMPERATURE NORMAL

"When you take into consideration the fact that this machine cycles up to 700 shots per hour, you will realize the necessity of adequate cooling of the hydraulic fluid", says B & T Engineering and Sales Co., manufacturer of high speed die casting machines.

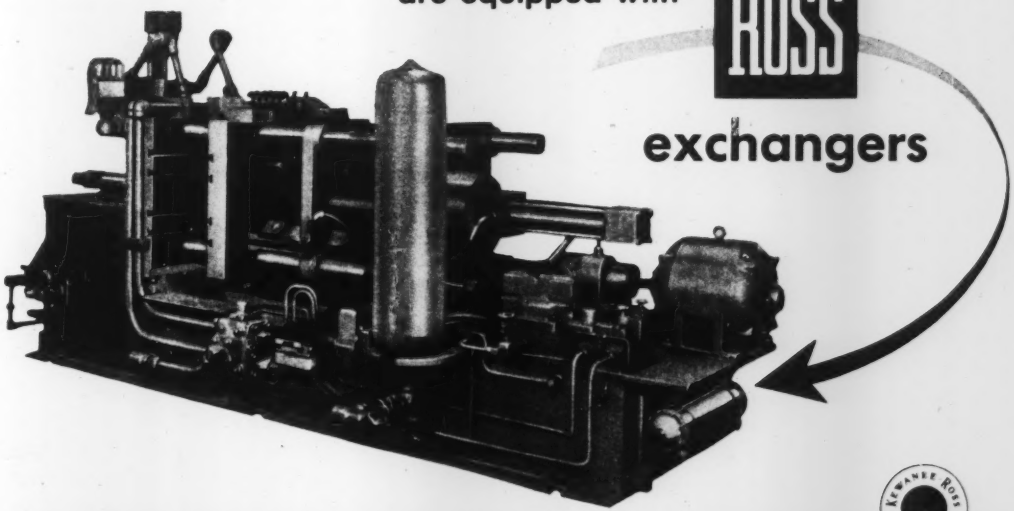
...and *adequate cooling* means only one thing to this highly regarded Detroit company: *heavy duty Ross Type BCF Exchangers*. They are standard specifications on all B-T machines. "We have found them to be the most efficient type of cooler we have been able to obtain."

Serving the hydraulic system of machines like these, which have a line pressure of 1000 psi, develop pressures up to 4000 psi on the metal injection, and exert a locking pressure of 450 tons, Ross Type BCF Exchangers have a heavy responsibility heaped upon them. Oil temperatures must *always* be right. Overheating and consequent oil-thinning cannot be tolerated. Pump slippage, robbing essential capacity, would result. But, the Ross Exchanger on this B-T machine, as on dozens of other makes, does the job it's called upon to perform. Temperatures are *kept* within recommended limits.

For information on the exchanger that machinery builders are proud to list as standard equipment, request Bulletin 1.1K5. It tells about the enduring copper and copper alloy construction, pre-engineering and standardization that have made Ross famous.

KEWANEE-ROSS CORPORATION
DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION
1431 WEST AVENUE • BUFFALO 13, N. Y.
In Canada, Horton Steel Works, Limited, Fort Erie, Ont.

B-T Die Casting Machines are equipped with ROSS exchangers



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Headquarters for

52100

Steel Tubing and Bars

New Headquarters of Peterson Steels, Inc., Union, New Jersey

Largest Stocks in the Country

of this versatile steel. 52100 is hard, tough and long wearing, yet it's easy to machine and is right for bearings, sleeves, pins, collars and many other machine parts.

Over 200 seamless tube sizes to choose from .898" O.D. to 8.250" O.D. Bar sizes from .171" round to 7.5" round. Also ring forgings in any analysis.

Write for our Latest Stock List Now

PETERSON STEELS, INC.

DEPT. S SPRINGFIELD ROAD
UNION NEW JERSEY

Detroit, Mich. • Chicago, Ill.

Work will be incorporated around present Robbins & Meyers motor laminations in order that student-conceived designs may be built with existing production tooling as far as possible.

Fuels Are Industry Tools

FUEL consumption in a progressive technical economy is not just a matter of more and more fuel and energy; some other and very important trends are developing, according to Frederic O. Hess, president of Sales Corp. of America, Philadelphia, in an address at the annual meeting of American Society of Mechanical Engineers in New York.

Citing several industries where fuels must be considered as a processing tool, Mr. Hess described refined heating or cracking operations in the petroleum industry which produces a gasoline of higher octane rating without addition of lead products.

Saves Time and Materials—Another important example is in the field of heat treating of steels which acquire alloy properties without addition of alloy metals. Fuel is here being substituted for critical metals, he added.

In another application, the printing industry, fuel is substituted for time in the production equation. Inks capable of drying instantly with heat application, and automatic heating apparatus built into the printing press eliminate drying time and also permit quadrupling of printing speeds.

"Fuels as a tool, are not only indispensable in a technical economy, but their use, more than any other material, governs the degree of progress and stability of a technical economy," concluded Mr. Hess.

Messer Gas Producers Are Back

Oxygen and other gases derived from air may now be produced with equipment of German design, said to offer unique advantages to users. Equipment and engineering service is available through American Messer Corp., New York, an affiliate and representative of Adolf Messer, Frankfurt, Germany.

The 50-year-old German firm was active in the U. S. before

Call SIMONDS First!

FOR LARGE

INDUSTRIAL GEARS

For fast, accurate, economical service on *all* your large or heavy-duty industrial gear requirements—call SIMONDS first. Nearly 60 years of specialized experience assures faithful reproduction of your most exacting specifications, on all types and sizes up to 145" diameter. Materials include cast or forged steel, gray iron, bronze, Meehanite, rawhide and bakelite. Centrally located, within easy shipping distance of heavy industrial areas, SIMONDS is your *logical source* for large industrial gears.

Stock carrying distributors for Ramsey Silent Chain Drives and Couplings, industrial V-Belts.

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ONE always stands out...

IN refractory dolomites it's...

BAKER'S MAGDOLITE

The J. E. Baker Company takes pride in announcing the completion of its new, modern plant in York, Pennsylvania. This new operation, supplementing our other plants in Eastern Pennsylvania and Ohio, will enable us to meet the increased demand for dolomite necessitated by the tremendous expansion of the steel industry. Yes, we can now assure you of the kind of dependable dolomite shipments that the people in the steel industry have needed—and to a larger area.

The superior quality of this new source of dolomite means the continuance of BAKER'S MAGDOLITE'S leadership within the industry . . . and guarantees top performance for you. Yes, those who know insist on BAKER'S MAGDOLITE . . . the original deadburned dolomite!

ALWAYS 5 WAYS BETTER—Composition • Preparation • Strength • Economy • Quality

JEBCO PRODUCTS SINCE 1889

THE J.E.BAKER COMPANY

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The unusual uniformity of gauge in MicroRold allows for closer die setting, assuring the fabricator of uninterrupted production in stamping, forming and blanking operations.

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From edge to edge—and end to end—only MicroRold has such outstanding uniformity of gauge.

WASHINGTON STEEL CORPORATION

WASHINGTON, PENNSYLVANIA

World War II and presently has over 130 oxygen producing plants as well as pure nitrogen plants operating in this country. The first units came to this country in the early 1920's, and many are still in service.

Messer units range in size from one to ten-ton units for the small user up to the large tonnage units exceeding 100 tons per day in capacity.

End of Cobalt Crisis Seen

COBALT, the critical metal for jet aircraft is fast coming off the shortage list. This year production, controlled by International Materials Conference, will top 21,000,000 pounds of which the U. S. will get about 14,000,000.

By the end of 1953, three new plants will add 5.7 million pounds to U. S. and Canadian capacity. Other gains are in prospect, for the Defense Materials Procurement Agency has entered into purchase agreements with world producers to step up their production.

Process Turns Trick—Big jump in North American production is expected as a result of the perfection of a process by American Cyanamid Co. for efficient and commercial processing of ores that run as low as 0.1 per cent metallic cobalt. The process bypasses the usual smelting and refining operations.

First, the ore is ground, put through flotation and gravitation processes to concentrate it. It is then leached under pressure in an autoclave, sent through a filter still in liquid form, and then reduced in another autoclave. The end product is pure metal in powder form.

Tough Odor Problem Solved

Catalytic burners alone couldn't completely eliminate undesirable odors associated with the manufacture of copper wire which is coated with baked synthetic lacquer at Ace Wire Mills Inc., Paterson, N. J. That was the problem facing Connor Engineering Corp., Danbury, Conn., called in to remedy the situation.

After ascertaining both quality and quantity of gases, they were found to be of a nature readily adsorbed by activated carbon, so the gases had to be diluted with sufficient plant air to keep air-gas temperature under the 118° F limit for activated carbon use.

The catalytic burners are helpful to the system in that they remove combustible matter, resulting in less reactivation of carbon.

Plant Builds First TV Tube

Production of electronic tubes has started in the two new plants of newly-formed Westinghouse Electronic Tube Division, company officials announce. Plants are located at Elmira and Bath, N. Y.

The plants will ultimately attain volume production of virtually all types of radio and television power and receiving tubes, as well as numerous tube types for industrial and national defense purposes.

Air-Steam Purifiers Cataloged

How to keep moisture and dirt out of paint spray equipment, air tools, chucks, and other pneumatic and steam equipment is covered in

For machine screws, wood screws, drive screws, specials, etc. These machines have automatic feed and self-lubrication. They feature accuracy, easy setup, rigidity and table-top working level. Model A-312 rolls screws from .138 through 5/16" diameter with thread lengths up to 2½". Smaller model A-190 rolls from .086 through .190 inches diameter with thread length up to 1½".

When it comes to production

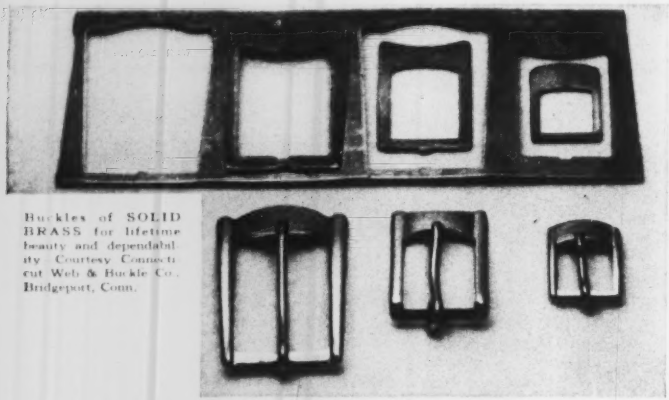
HARTFORD *Special*

THE HARTFORD SPECIAL MACHINERY CO., HARTFORD 12, CONN.

BRIDGEPORT BRASS COMPANY

COPPER ALLOY BULLETIN

"Bridgeport" BRASS CO. MILLS IN BRIDGEPORT, CONN. AND INDIANAPOLIS, IND. — IN CANADA: NORANDA COPPER AND BRASS LIMITED, MONTREAL



Buckles of SOLID BRASS for lifetime beauty and dependability. Courtesy Connecticut Web & Buckle Co., Bridgeport, Conn.

Solid Brass Buckles

Advantages of Brass for both Fabricator and User

When you buy a brass buckle with "SOLID BRASS" stamped on the back, you know that you will never be bothered by unsightly rust. Once the lacquer finish is worn off, constant use will keep the buckle bright and attractive.

On the other hand, lower price competition may bring out brass-plated steel buckles which before actual use look like the genuine article. But a magnet will quickly reveal the deception, or with time the gray color of steel and rust may appear after the plate is worn off.

Yet, with the many advantages that brass has to offer, one wonders why manufacturers deal with inferior metals for an application which calls for both utility and attractive appearance.

Brass Is Easier to Fabricate

Brass is one of the easiest metals to work with. Blanking and stamping tools stand up very much longer. Polishing is easier and quicker especially if special processing procedures are carried out by the mill to supply the correct grain size. Also a smooth, clean surface, free from scaling, scratches, or dents is required.

Brass can be supplied in various alloys so that the color of the metal can range from yellow (copper 65%, zinc 35%), to pale gold (copper 80%, zinc 20%), to rich golden color (copper 85%, zinc 15%) and to bronze (copper 90%, zinc 10%). The manufacturer therefore has a choice of color effects to give his products variety and interest. A clear lacquer coating is given to the finished article to prevent tarnishing from handling before the buckle reaches the ultimate consumer.

Many Savings Possible

To offset rising costs of labor and materials, the successful fabricator must seek savings in manufacturing costs without jeopardizing quality. For example, a certain amount of labor and polishing supplies are required to develop the high lustre on buckles called for by the trade. Ordinary brass with the normal grain size and temper may develop a grainy surface after the forming operation. This must be cut down by the buff wheel. On the other hand, by supplying brass with an ultra-fine grain size, the smooth surface is retained after forming. Consequently, only a minimum of polishing or coloring is required to bring up a high polish. In this way, the cost of this expensive operation is reduced.

Keeping skeleton scrap to a minimum is another objective which brings gratifying results if successfully accomplished. Illustrated is the skeleton scrap generated from making three different sizes of buckles. The smallest one was blanked from the inside of the middle size one, which in turn was blanked from the inside of the largest one. Please note that the middle one was produced with no scrap whatsoever! The only scrap in the smallest one comes from the center of the buckle. If the manufacturer decides to use it for making an ornamental button or for some other application, this scrap will also be utilized. The largest buckle was, of course, produced with the normal amount of skeleton scrap.

Let Us Help You With Your Metal Problems

In the interest of economical manufacturing and high speed, quality production, Bridgeport Laboratory will be glad to work with customers on their metal problems by studying the product and the steps used in making it. Metal of the proper composition and temper can be supplied to reduce waste and speed up costly operations. In some instances, by changing to a different alloy, it is possible to improve the product itself so that it will stand up longer for trouble-free service. Much information on the most popular copper-base alloys, their applications, as well as numerous valuable tables and working hints are found in Bridgeport's "Technical Handbook." Contact the nearest Bridgeport Sales Office for your brass, bronze and copper requirements. (9212)

Copper and Its Alloys Ideal for Heavy Duty Contactors

D.C. Magnetic Contactors – used as motor starters, crane controls, press controls, etc.–must be capable of handling anywhere from 25 to 900 amperes, open and close rapidly with a minimum of arcing and burning, and withstand corrosion even when exposed to the elements. To meet these requirements, parts forming the electrical circuit are made of high conductivity copper and alloys such as free cutting brass and Phosphor Bronze. Parts such as the studs, contact tips and arc horns, which require machining, are less costly to produce in copper or brass because of less tool wear and spoilage.

Vari-Time Contactor

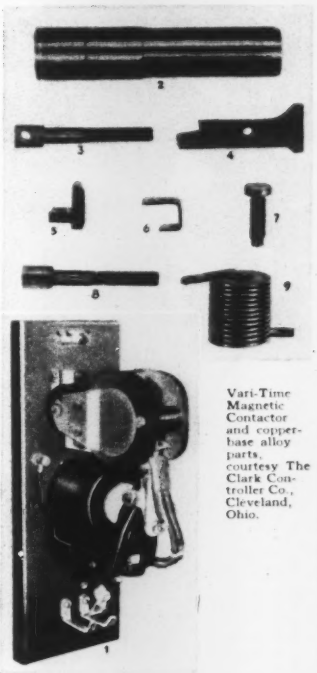
Illustrated is a Clark Controller Vari-Time Magnetic Contactor (1). Its special core provides an adjustable time delay before closing after the coil has been energized. The timer (2) consists of a core tube machined from free-cutting brass bar stock. The I.D. of the tube is reamed smooth and has a tolerance of +.0005". The core cap and valve seat are machined from free-cutting brass; the washer is made from commercial bronze. The assembled core is filled with a special oil of controlled viscosity; then the core tube is sealed by soldering the core cap in place. Timing is adjusted by stop stud, on the front of the contactor, which varies the gap between the armature and the front of the core.

The entire VT Core is designed and built to give exceptionally long life. When VT cores have been taken apart and rigidly inspected after years of hard service, they have shown no appreciable wear or deterioration.

Other copper alloy parts used on the contactor are as follows:

Blowout Stud (3)–machined from high conductivity hard copper square bar stock, then silver coated.

Rear Contact Stud (4)–an extruded part made from free-cutting brass rod, silver coated after being drilled and tapped.



Vari-Time Magnetic Contactor and copper-base alloy parts, courtesy The Clark Controller Co., Cleveland, Ohio.

Contact Tips (5)–made from high conductivity copper forced through a die producing an oversized cross section of the tip, then cold drawn through a sizing die which also imparts the correct hardness to the copper.

Front Arc Horn (6)–formed from a Phosphor Bronze Grade A strip. Rear arc horn, not illustrated, is formed from a high conductivity copper strip. Both are silver coated.

Stop Stud (7) – machined from Phosphor Bronze Grade B-1 alloy.

Connector Stud (8)–machined from high conductivity hexagon-shaped copper rod.

Many factors must be considered before deciding what copper alloy to use for a particular application. For help with any of *your* metal problems, call on Bridgeport Brass.

NEW DEVELOPMENTS

This column lists items manufactured or developed by many different sources. None of these items has been tested or is endorsed by the Bridgeport Brass Company. We will gladly refer readers to the manufacturer or other sources for further information.

Air-Driven Midget Screwdriver also handles nuts and bolts. Screws up to No. 12, and nuts and bolts up to ¼-in. diameter bolt size are said to be easily run by 80 to 100 lb. air pressure. Three types of clutch mechanisms are adaptable to free speeds of 580, 1200 and 2400 rpm. Tools can be fitted with pistol or lever type throttle handles. **No. 1268**

Miniature Solderless Terminals made for wire, sizes 26 to 22, stranded or solid, are available in variety of tongue shapes. They are reported to be strong, vibration-resistant and free of RF noise. Terminals are either insulated or noninsulated, with or without insulation support sleeves. Connectors with clear polyvinyl insulation permit quick, permanent splices which can be inspected at a glance. **No. 1269**

Pocket Microscope, 50-power, contains an engraved scale in body tube for direct reading to .002" and estimations to .0005". It is said to be fully corrected for spherical and color aberration. It is useful for measuring threads, cracks, small-hole diameters, markings, surface imperfections, hardness test impressions, etc. **No. 1270**

Gear-Type Tube Bender is said to bend any type tubing, including hard-drawn copper and hard-tempered steel from ⅜ to 1⅛ in. OD. Bender can be positioned at any point on tube, even when one end is connected. Will make right or left hand, return, offset and right angle bends. It can be held by hand, clamped in vise or bolted to bench. Extension handle allows holding bender in pipe vise. **No. 1271**

Briquetting Press converts low-grade bulk metal turnings, chips, borings and shavings into dense cylindrical briquettes which are suitable for direct charging into furnaces or foundry cupolas. Is said to decrease scrap handling costs, save storage, conserve critical metals. **No. 1272**

BRASS, BRONZE, COPPER, DURONZE, NICKEL SILVER, CUPRO NICKEL

"Bridgeport" BRASS CO.

BRIDGEPORT BRASS

BRIDGEPORT BRASS COMPANY, BRIDGEPORT 2, CONN. • ESTABLISHED 1865

Mills at Bridgeport, Connecticut, and Indianapolis, Indiana • In Canada: Noranda Copper and Brass Limited, Montreal

Warehouse Service with Slitting Facilities in Principal Cities

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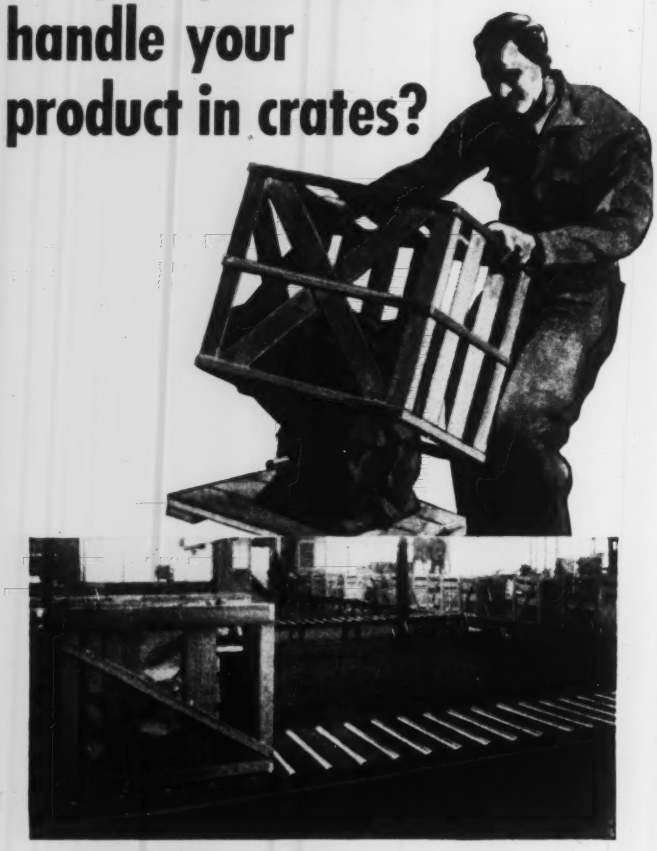
Do you pack and handle your product in crates?



Whatever you make, pack or handle, STANDARD CONVEYORS can speed operations

Material handling often constitutes as much as 50% of total production cost — cut handling costs and you cut production cost.

More than 45 years' experience qualifies Standard to be of expert service on any "package" conveyor need — roller, belt, slat, chain, push-bar, sectional, portable self-contained conveyor units — spiral chutes — pneumatic tube systems. Write —

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Flowery Facts

STEEL PRODUCERS probably don't realize it, but the local florist is a pretty good customer. According to an estimate by one wire manufacturer reported by American Iron and Steel Institute, bridal bouquets, corsages and other floral pieces utilize about 8000 tons of wire annually.

Florists wire is made from low carbon steel, drawn through dies to diameters as small as 0.01 inch up to 0.06 inch. Often coated with copper, brass or tin to make it bright, it is heat treated in such a way that the end product can be bent into intricate designs without danger of breaking.

Long coils of the wire are straightened and cut to 9, 12, 18 and 24 inch lengths. These short pieces are then packed into boxes for sale and shipment.

an 8-page booklet published by V. D. Anderson Co., Cleveland. Equipment layout and piping blueprints, selection tables, dimensions, and capacities of Anderson's Hi-eF line of purifiers is also included.

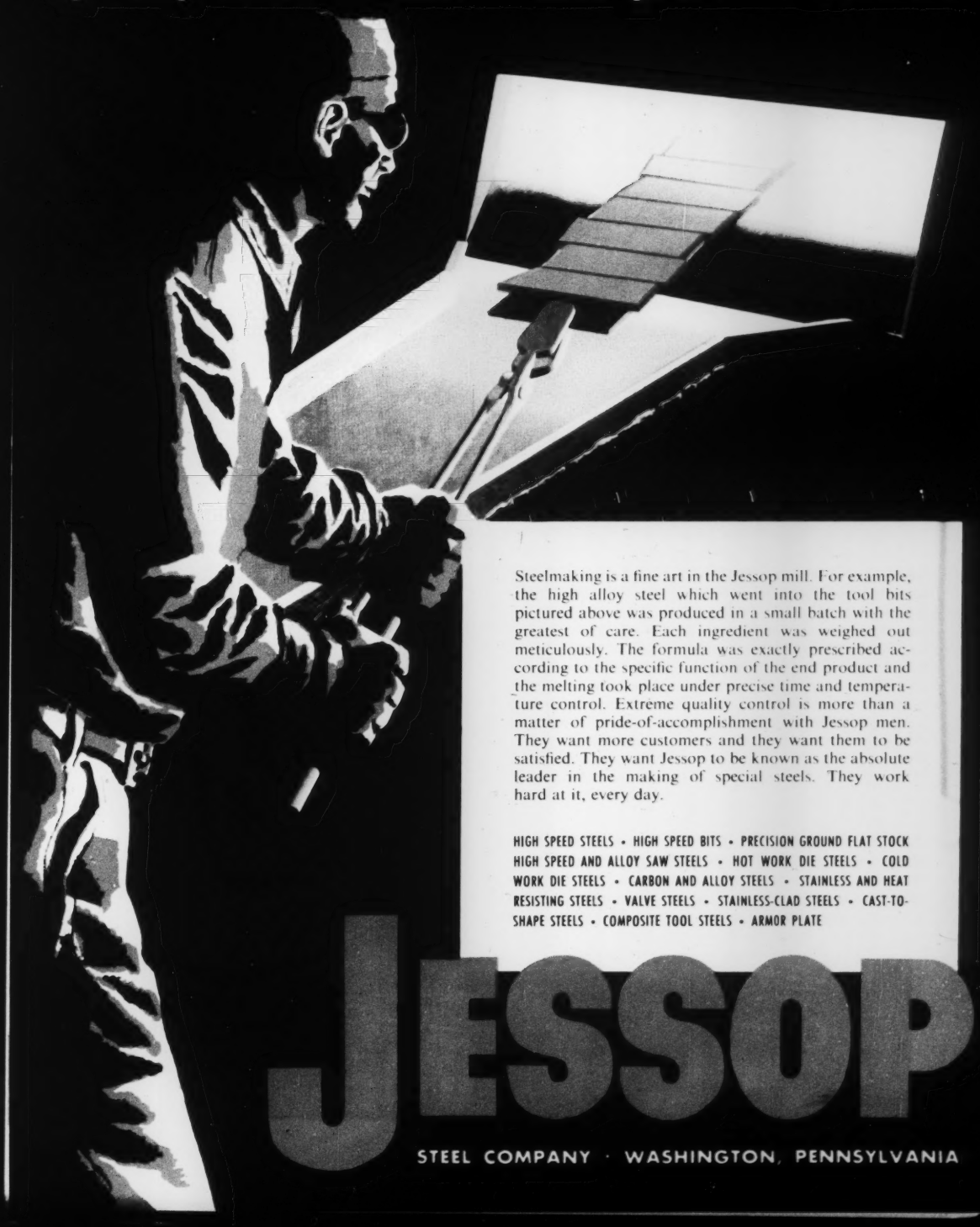
Anti-Corrosion Siding

An improved enameled steel roofing and siding material specially made for individual building construction and repair will be manufactured by the Toledo Porcelain Enamel Products Co., Toledo, O.

The material is called Vitri-Cor and is made from a corrugated steel base to which porcelain enamel has been fused at 1650° F. The enamel coating on corrugated steel offers protection against fire, corrosive gases, moisture, steam, smoke and salt air, and reduces both roofing and siding costs in the industrial plant.

The siding can be easily applied to wood or steel frames in the conventional manner at the usual cost of erection for high grade protected sheets. All holes are drilled on the job with a portable high-speed drill to receive nails or bolts. In application to steel frames, a variety of fasteners made of corrosion-resistant materials is available to suit any particular design, location or conditions.

quality steel is more than pride at JESSOP



Steelmaking is a fine art in the Jessop mill. For example, the high alloy steel which went into the tool bits pictured above was produced in a small batch with the greatest of care. Each ingredient was weighed out meticulously. The formula was exactly prescribed according to the specific function of the end product and the melting took place under precise time and temperature control. Extreme quality control is more than a matter of pride-of-accomplishment with Jessop men. They want more customers and they want them to be satisfied. They want Jessop to be known as the absolute leader in the making of special steels. They work hard at it, every day.

HIGH SPEED STEELS • HIGH SPEED BITS • PRECISION GROUND FLAT STOCK HIGH SPEED AND ALLOY SAW STEELS • HOT WORK DIE STEELS • COLD WORK DIE STEELS • CARBON AND ALLOY STEELS • STAINLESS AND HEAT RESISTING STEELS • VALVE STEELS • STAINLESS-CLAD STEELS • CAST-TO-SHAPE STEELS • COMPOSITE TOOL STEELS • ARMOR PLATE

JESSOP

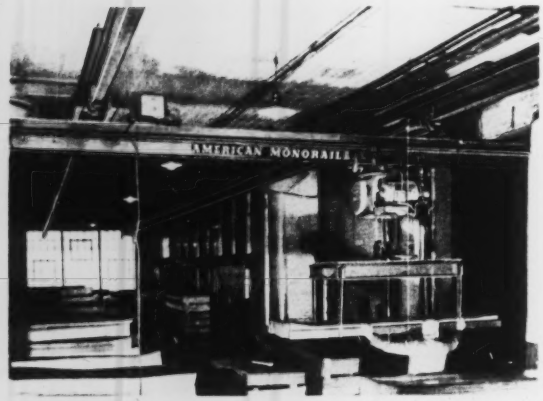
STEEL COMPANY · WASHINGTON, PENNSYLVANIA

AMERICAN MONORAIL

- **INCREASES PLANT CAPACITY AND PRODUCTION**
- **REDUCES HANDLING COSTS, DAMAGE AND LOSS**

American MonoRail Engineers can show you how to get more profitable production out of your plant by systematizing material handling. Let them show you how to convert lost ceiling space to profit—how to eliminate obstructive storage around machines—lessen worker fatigue—reduce heavy load accidents—stop damage to product in motion.

Bring us your handling problems—American MonoRail can provide the equipment best suited to your needs.



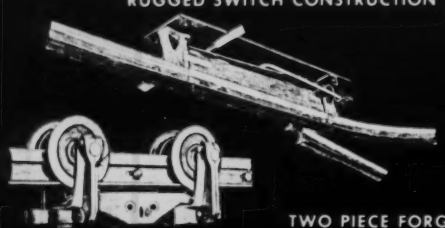
SEND FOR BULLETIN C-1

A 56 page book showing how American MonoRail Engineers have successfully solved other companies' handling problems.

THE AMERICAN MONORAIL COMPANY

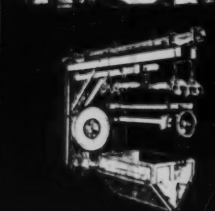
13102 ATHENS AVENUE — CLEVELAND 7, OHIO

RUGGED SWITCH CONSTRUCTION



OVERLAPPING SPLICE

TWO PIECE FORGED YOKES



SCALE HOIST CARRIER

FREE MOVING CRANES

NATO Standards Lack Hit

MOST dangerous impediment to the rearmament effort of the North Atlantic Treaty Organization is the lack of standardization in making engineering drawings and blueprints, according to William L. Batt, retiring U. S. minister for economic affairs to the United Kingdom, at a recent meeting of American Standards Association.

Mr. Batt declared that costly production delays are resulting from the need to redraw American, British and Canadian blueprints to fit the shop practices of the individual countries. Standardization, he claims, would be the most important single step the three countries could take to make better use of their combined resources.

Russia Doing It—Pointing to the standardization effort of the Soviet Union and its seven European satellites, he disclosed that new engineering standards received from Czechoslovakia now carry the same number as the Russian standard on the same subject, have titles in both Russian and Czech, and carry notations on their differences.

"Russia is straining the manpower and resources of Eastern Europe," he said, "for an integrated, controlled economy." By comparison, he added, this is the third time we have come to the aid of Europe, and each time we have faced the same headaches, delay and waste arising from lack of international standards.

Common Denominator—Mr. Batt referred to standardization as the common denominator to the solution of military and economic problems, both in the field and factory. Much of the responsibility for Europe's low level of output per man, he believes, can be traced to traditional lack of standards in product and material specifications.

Camera Records Position-Time

Based on the action of a mirror which rotates at a speed of 50,000 rpm and wipes an image onto film at a sweep rate of 5.466 millimeters per microsecond, a new research camera, model 168, is announced by Beckman & Whitley Inc., San Carlos, Calif.

Belonging to the general classi-

it's time to view
FIRE PROTECTION
in terms of TODAY!

Two significant factors in today's economy make it extremely important for you to take another look at your *fire protection* in the light of modern developments.

First, is the current inflationary spiral.

Second, is the trend toward more efficient utilization of buildings and equipment. Commercial and institutional properties are taxing their facilities by operating at or near capacity. Industry uses more complicated automatic machines and processes to achieve a higher production rate.

The net result of both is a record high valuation of all property — in terms of higher investment and replacement costs, and of higher occupancy values.

Adequate Fire Protection is essential to safeguard these values and assure business continuity.

Automatic Sprinkler 10-Point Fire Protection is geared to meet these modern demands. It's scientifically designed to minimize property loss and business interruption resulting from fire. It starts with a survey of your specific needs, then designs, fabricates and installs exactly the right system best suited to your particular hazard. It employs the most positive, fastest-acting fire detection devices and the most effective extinguishing media.

The modern way to look at fire protection is described in "Automatic" Sprinkler's factual book *"The ABC of Fire Protection"*. Write for your copy today.

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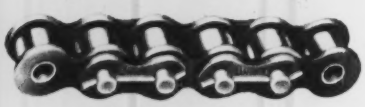
FIRST IN FIRE PROTECTION

Union Chain's Performance Story PART·II

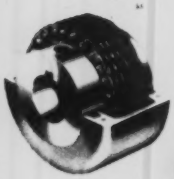
HOW UNION CHAIN MANUFACTURES

Since Union Chain concentrates all its efforts on the production of steel chains, sprockets and attachments, it has been able to make important advances in designing, manufacturing and testing. The resulting superiority of performance can also be attributed to the meticulous accuracy with which both conventional and *extra exclusively Union* manufacturing operations are executed.

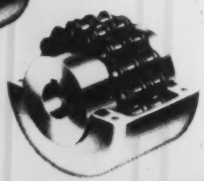


UNION ROLLER CHAIN

UNION HEAVY DUTY CHAIN



UNION SILENT CHAIN FLEXIBLE COUPLING



UNION ROLLER CHAIN FLEXIBLE COUPLING

Part I - How UNION CHAIN *Specializes*

Union Chain manufactures nothing but sprocket chains, sprockets and attachments. Not only that—Union Chain is the only manufacturer producing every type of steel sprocket chain *exclusively*. Such specialization is the reason Union Chain consistently produces chains of the finest quality for every possible application.

Part III - How UNION CHAIN *Recommends*

There is no need for Union Chain to recommend any chain but the right one — since Union Chain makes every type. Moreover, wide experience with every type of chain makes a recommendation from Union Chain's engineering staff a valuable one.

Part IV - How UNION CHAIN *Distributes*

Direct Factory Representatives are located in most industrial cities to provide a two-way communication service between customer and factory. See list at right—as well as list of Stock Carrying Distributors.*

* At the present time there is a heavy demand for many types of chain. Consequently, our distributors are not always in a position to fill all orders from stock.

HB STRAIGHT SIDE BAR ROLLER CHAIN

FINISHED STEEL ROLLER CHAIN • SILENT CHAIN • HEAVY DRIVE AND CONVEYING CHAIN •

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Fayetteville, Arkansas

CALIFORNIA
American Chain & Gear Co.
5511 Pacific Blvd.
Huntington Park, California

Charles A. Fowler
889 Bryant St.
San Francisco 3, California

Valley Belting & Equipment Co.
2309 Los Angeles St.
Fresno, California

CONNECTICUT
Ideal Machinery Company
Plainville, Connecticut

Motor Equipment Co.
Wall & Water Sts.
Bridgeport 3, Connecticut

DELAWARE
The Briggs Rubber Products Co.
Wilmington, Delaware

Standard Industrial Supply Co.
403 Adams St.
Wilmington, Delaware

FLORIDA
Ellis & Lowe Co., Inc.
302-306 S. Morgan St.
Tampa, Florida

Farquhar Machy. Co.
720 West Bay St.
Jacksonville, Florida

General Equipment & Supply Co.
543 N. W. 5th Street
P. O. Box 1470
Miami, Florida

Industrial Marine Supply Co.
Pensacola, Florida

GEORGIA
Bearings & Drives, Inc.
515 Arch Street
Macon, Georgia

Georgia Hardware & Supply Co.
307 N. Washington St.
Albany, Georgia

Jim Horne Mill Supplies
Shellman, Georgia

Macon Supply Co.
Macon, Georgia

Phillips Hardware & Supply Co.
1022 Front Ave.
Columbus, Georgia

GEORGIA
Richmond Supply Co.
Augusta, Georgia

John D. Robinson Co.
13 Bay Street West
Savannah, Georgia

J. M. Tull Metal & Supply Co.
285 Marietta St. N. W.
Atlanta 3, Georgia

IDAHO
Western Bearings, Inc.
520 Front St.
Boise, Idaho

Western Bearings, Inc.
156 South Third St.
Pocatello, Idaho

ILLINOIS
Hagerty Bros. Co.
923 S. Washington St.
Peoria 2, Illinois

W. M. Hales
P. O. Box 65
Danville, Illinois

W. M. Hales Co.
719 S. Main St.
Millsboro, Illinois

W. M. Hales Co.
W. Frankfort, Illinois

Mid-States Industrial Corp.
2401 Eleventh St.
Rockford, Illinois

Northern Illinois Supply Co.
Carpentersville, Illinois

INDIANA
Diamond Supply Co., Inc.
616-24 N. W. Second St.
Evansville, Indiana

Sherer Electric Co.
940 S. West Street
Indianapolis 25, Indiana

The South Bend Supply Co.
South Bend, Indiana

KANSAS
Bearing Service Co.
341 N. St. Francis Ave.
Wichita 2, Kansas

W. A. Thomas Supply Co.
112-114 West Third St.
Pittsburg, Kansas

KENTUCKY
Ernest Hardware & Supply Co.
829 National Ave.
Lexington, Kentucky

Sherman Bros. Mill Supply
222 South Shelby St.
Louisville 2, Kentucky

LOUISIANA
Behring's Bearing Service, Inc.
Lake Charles, Louisiana

Dixie Bearing & Supply Co., Inc.
733 N. 21st St.
Baton Rouge, Louisiana

Weeks Supply Co., Ltd.
Monroe, Louisiana

Woodward Wight & Co., Ltd.
New Orleans, Louisiana

MARYLAND
Hagerstown Equipment Co.
Maryland Ave. & Memorial Blvd.
Hagerstown, Maryland

M. P. Holland Co.
Lee & Sharp Sts.
Baltimore, Maryland

MASSACHUSETTS
Bellamy-Robie, Inc.
45 Main St.
Cambridge, Massachusetts

Babcock Equipment Co.
163 Highland Ave.
Needham Heights 94, Mass.

MICHIGAN
Abrasive Supply Co.
821 W. Milwaukee Ave.
Detroit, Michigan

MINNESOTA
Iron Range Equipment Co.
490 N. Snelling Ave.
St. Paul, Minnesota

Jurgens Company
519 Cleveland Ave.
St. Paul 4, Minnesota

MISSOURI
Bonne Terre Farming & Cattle Co.
Bonne Terre, Missouri

Industrial Equipment Corp.
325 E. Walnut St.
Springfield, Missouri

Te-Co, Inc.
801-805 N. Second St.
St. Louis, Missouri

Wildhagen Machine & Supply Co.
224 S. Third St.
St. Joseph 3, Missouri

MONTANA
Western Foundry Co.
802 Toole Ave.
Missoula, Montana

NEW JERSEY
Burton Supply Co.
165 Park Ave.
Paterson, New Jersey

Mill Supply & Hardware Co.
285-289 N. Willow St.
Trenton 4, New Jersey

Old Reliable Supply & Equipment Co.
11th St. & Newton Ave.
Camden, New Jersey

NEW MEXICO
Union Industrial Corporation
112 East Mermod St.
Carlsbad, New Mexico

NEW YORK
Lawrence Belting Co.
111 Chambers St.
New York, New York

S. H. Pooley Belting Co.
38 W. Seneca Street
Buffalo 2, New York

Transmatic Equipment Co.
11 North Pearl St.
Albany, New York

U. & S. Inc.
509 South West Street
Syracuse, New York

Ulster Foundry Corp.
20 St. James St.
Kingston, New York

NORTH CAROLINA
Piedmont Mill Supply Co.
P. O. Box 130
Salisbury, N. Carolina

OHIO
Brubaker Gear & Mfg. Co.
Barberton, Ohio

Cincinnati Transmission Co.
3330 Montgomery Road
Cincinnati 7, Ohio

C. J. Edwards Company
6408 Euclid Ave.
Cleveland 3, Ohio

Lima Armature Works, Inc.
440 N. Main St.
Lima, Ohio

Mill & Factory Supply Co.
312-10th St.
Toledo, Ohio

Wilkof Hardware & Supply Company
1100 Warner Road, S. E.
Canton, Ohio

Winkle Electric Co., Inc.
701 Andrews Avenue
Youngstown 2, Ohio

OKLAHOMA
C. F. Dagwell & Company
816 W. Main St.
Oklahoma City, Oklahoma

Ore Reclamation Company
301 N. Cornell Ave.
Fisher, Oklahoma

OREGON
Electric Steel Foundry
Eugene, Oregon

Fisher Bros. Company
522 Bond Street
Astoria, Oregon

Industrial Machinery & Supply Co.
1410 Adams Avenue
La Grande, Oregon

Industrial Steel & Supply Co.
North Bend, Oregon

J. W. Minder Chain & Gear Co.
307 S. E. Hawthorne Blvd.
Portland 14, Oregon

PENNSYLVANIA
A. C. Supply Company
1330 Federal Street
Philadelphia, Pennsylvania

S. S. Brenner
2303 E. Philadelphia Street
York, Pennsylvania

Clark Materials Handling Equipment Co.
1401 Derry Street
Harrisburg, Pennsylvania

Industrial Supply Co.
451 E. Broad St.
Hazleton, Pennsylvania

Keystone Bearing & Supply Co.
Second and Hamilton Sts.
Allentown, Pennsylvania

Maximan Machine Co.
801 N. Logan Blvd.
Altoona, Pennsylvania

Reilly Bros. & Raub
44 N. Queen St.
Lancaster, Pennsylvania

Sherwin Bearing Co.
1120 Wyoming Avenue
Scranton 1, Pennsylvania

Transmission Equipment Co.
955 E. Carson St.
Pittsburgh 10, Pennsylvania

SOUTH CAROLINA
Crawford & Garner, Inc.
P. O. Box 1819
Spartanburg, S. Carolina

O Brian Debnam Company
213 E. Evans St.
Florence, S. Carolina

Southern Mill Supply Co.
Summerville, S. Carolina

Thackston-Davis Supply Co.
828 Gervais Street
Columbia, S. Carolina

TENNESSEE
Hoyt N. Payne Co.
P. O. Box 942
410 E. Depot Ave.
Knoxville, Tennessee

Tennessee Machinery Co.
114-119 Third Ave. South
Nashville 3, Tennessee

Tipps Engineering & Supply Co., Inc.
260 N. Front St.
Memphis, Tennessee

TEXAS
Allied Belting & Trans. Co.
2614 Sylvan Ave.
Dallas, Texas

Beacon Supply Co., Inc.
1825 Washington Ave.
Houston 10, Texas

Bearing Specialists Co.
2902 Texas
Lubbock, Texas

El Paso Machine Works, Inc.
1600 E. 4th St.
El Paso, Texas

Great Western Supply Co.
14th & Throckmorton
Fort Worth, Texas

E. B. Hayes Machinery Co.
Marshall, Texas

Lloyd Electric Co.
511 El Paso St.
San Antonio, Texas

Overton & Mims, Inc.
1307 Indiana
Wichita Falls, Texas

VIRGINIA
Blue Ridge Hardware & Supply Co.
Bassett, Virginia

Mill Supplies Corp.
South Norfolk, Virginia

WASHINGTON
Electric Steel Foundry
1327 Washington St.
Spokane, Washington

WEST VIRGINIA
Park Engineering Sales Co.
2391 Dudley St.
Parkersburg, W. Virginia

Bluefield Hardware Co.
Bluefield, W. Virginia

Smith Steel Supply Co.
150 Peninsula St.
Wheeling, W. Virginia

WISCONSIN
Dale Industrial Supply Co.
528 Forest St.
P. O. Box 867
Wausau, Wisconsin

Richard E. Ela Co.
744 Williamson St.
Madison, Wisconsin

The Union Chain and Manufacturing Company • Sandusky, Ohio, U.S.A.

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fication often referred to as smear or streak cameras, this instrument is designed for studying self-luminous transient events such as explosive, flash tube and spark-discharge phenomena.

Event to be studied is oriented before vertical slit and photographic record is obtained on a 4 x 5-inch film located in the film holder between the operator's hands. A 4 x 10-inch film holder can be used on modified units.

The high-speed rotating mirror is located inside the upper right section of the housing below the vertically-projecting knob.

This knob secures a vacuum-tight round access panel through which the mirror is rotated preliminary to a photographic run.

Firm Lists Carbide Tool Line

Listings and illustrations of their complete line of carbide-tipped and high speed tool bits has been published in catalog form by Whitman & Barnes, Plymouth, Mich. Carbide line includes turning tools, offset side cutting, offset and cutting, pointed nose, square nose and 60° angle threading tools. The catalog is sent free upon request.

TV Camera Is Brief-Case Size

Production of a highly portable, completely self-contained television camera, is announced by the Dage Electronics Corp., Beech Grove, Ind. Camera is a portable lightweight, completely self-contained closed circuit television station—14 x 9⅜ x 4⅝ inches.

This camera has been designed to utilize any standard television receiver, permitting an unlimited range of screen sizes; no alterations to the receiver are necessary. Daylight or normal room light are sufficient for clear transmission and reception in most circumstances.

Fitted for mounting to any standard camera tripod, the unit can also be permanently mounted to fit any conditions of installation. A single camera can televise to just one, or simultaneously to several, receivers; conversely, one receiver can pick up several cameras by simple channel switching at the receiver.

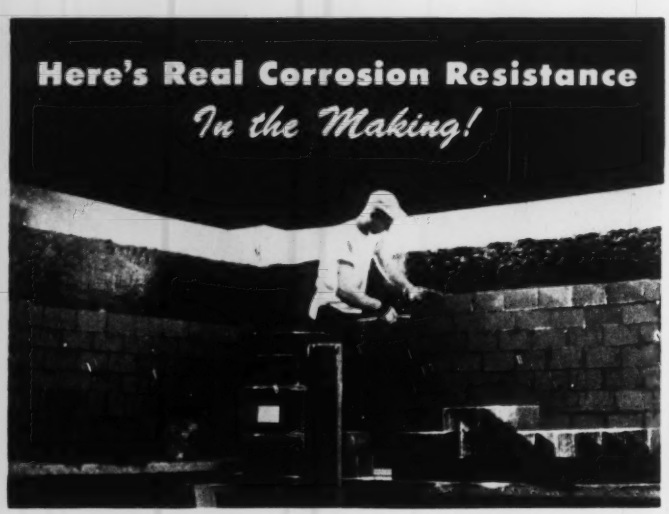
X-Ray Studies Reviewed

A survey of the world-wide work currently going on, in exploring the atomic structure of solid matter by the use of x-rays is presented in a report of the Office of Naval Research, available from Office of Technical Services, U.S. Department of Commerce.

The report includes 16 papers presented by authorities from the U.S., England, France and Germany at a conference recently held at the University of Wisconsin. Also included is a paper on how to build better vacuum pumps and another on making better geiger-counters for use in x-ray spectrometers. Price of the 82-page survey is $2.25.

Keys To Better Magnet Service

Methods by which users of traveling or overhead cranes can step-up efficiency on all magnet operations in steel plants is described in a 16-page bulletin published by McCaffrey-Ruddock Tagline Corp., Los Angeles. It is available free of charge.



WHEN Oneida Ltd., famous makers of Community Plate silverware of Oneida, N. Y., installed their big new acid neutralizing and recovery tank — they built it to last.

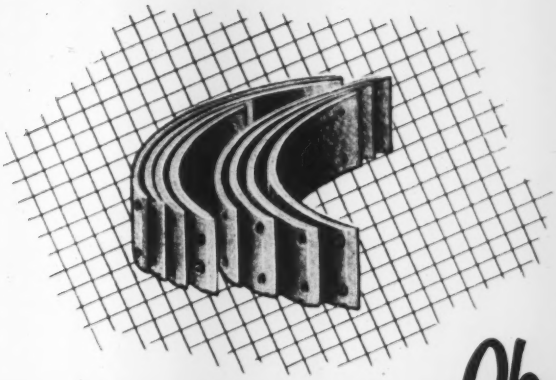
Wisely, they chose U. S. Stoneware's "triple-construction" acid-proof masonry for the job. "Triple-construction" means three-way protection: protection in the brick, protection in the joints, and protection in the membrane between brick and concrete shell.

U. S. Stoneware's furane-based Durisite cement gives tight, thin, non-porous joints of high compressive strength — and top quality corrosion resistance over a wide temperature range. "U.S." Acid Brick are hard, strong and dense—highly resistant to spalling and erosion. Resilon membrane forms an impervious protective barrier between brick and shell.

For economy in construction, and durability in service, specify U. S. Stoneware "triple-construction" acid-proof masonry — positive protection against chemical attack.

U. S. STONEWARE
Akron 9, Ohio
PROCESS EQUIPMENT DIVISION

530



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Farm Implements . . . Hoists . . . Tractors

Earth Moving and other Industrial Machinery

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ATHENIA STEEL...*Clifton, N. J.*	Flat, High Carbon, Cold Rolled Spring Steel
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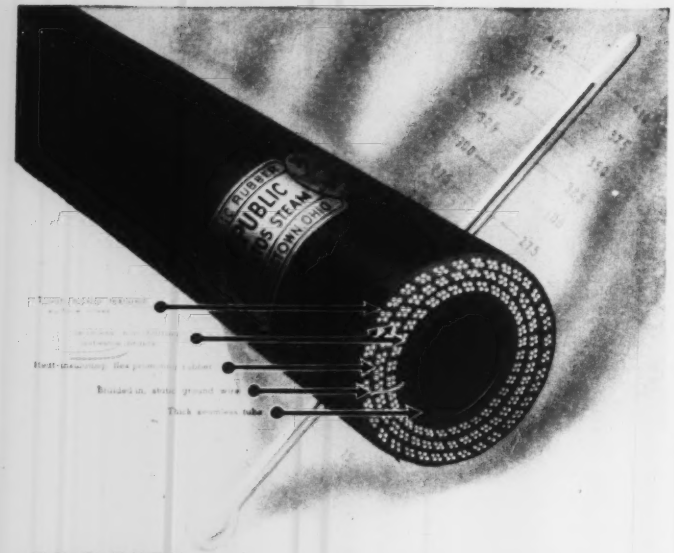
WAGNER LITHO MACHINERY...*Jersey City, N. J.*	Metal Decorating Equipment
WORCESTER WIRE WORKS...*Worcester, Mass.*	Round and Shaped Steel Wire, Small Sizes

NS NATIONAL-STANDARD Company NILES, MICHIGAN



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LEE RUBBER & TIRE CORPORATION, YOUNGSTOWN 1, OHIO

INDUSTRIAL RUBBER PRODUCTS

CALENDAR
OF MEETINGS

December 16-17, Industrial Truck Association: Winter meeting. Hotel Statler, New York. Association address: 900 F St. NW, Washington 4. Secretary: Wm. Van C. Brandt.

December 18, Material Handling Institute: Annual meeting. Hotel Statler, New York. Institute address: 731-732 DuPont Circle Bldg., Washington 6. Managing director: R. Kennedy Hanson.

January 11-13, Institute of Scrap Iron & Steel: Annual meeting. Hotel Commodore, New York. Institute address: 1729 H St. NW, Washington 6. Executive vice president: Edwin C. Barringer.

January 12-13, Industrial Furnace Manufacturers Association: Winter meeting. Hotel Cleveland, Cleveland. Association address: 420 Lexington Ave., New York.

January 12-16, Society of Automotive Engineers: Annual meeting and engineering display. Hotel Sheraton-Cadillac, Detroit. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

January 13, Mining & Metallurgical Society of America: Annual meeting. Mining Club, New York. Society address: 11 Broadway, N. Y. Secretary: Lt. Col. Donald M. White.

January 15-16, National Industrial Conference Board: General Session. Hotel Astor, New York. Address: 247 Park Ave., New York 17. Secretary: Clyde L. Rogers.

January 15-17, National Tool & Die Manufacturers Association: Winter quarterly meeting. Sorrento hotel, Miami Beach, Fla. Association address: 907 Public Square Bldg., Cleveland. Secretary: George S. Eaton.

January 19-22, Plant Maintenance Conference: Cleveland Public Auditorium, Cleveland. Managers: Clapp & Poliak Inc., 341 Madison Ave., New York 17.

January 19-23, American Institute of Electrical Engineers: Winter general meeting. Hotel Statler, New York. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

January 20, Cutting Tool Manufacturers Association: Annual meeting. Hotel Statler, Detroit. Association address: 416 Penobscot Bldg., Detroit. Secretary: Emil Gairing.

January 20-22, Caster & Floor Truck Manufacturers Association: Winter meeting. Roosevelt hotel, New York. Association address: 27 E. Monroe, Chicago. Secretary: H. P. Dolan.

January 21-22, Steel Shipping Container Institute Inc.: Winter meeting. Pierre & Hampshire House, New York. Institute address: 600 Fifth Ave., New York 20. Secretary: L. B. Miller.

January 22, American Coke & Coal Chemicals Institute: Regional meeting. Edgewater Beach hotel, Chicago. Institute address: 711 14th St. NW, Washington 5. Executive Secretary: Samuel Weiss.

January 22-23, Steel Plate Fabricators Association: Annual meeting. Palmer House, Chicago. Association address: 37 W. Van Buren St., Chicago. Secretary: Dwight Evans.

January 23, Malleable Founders' Society: General meeting. Hotel Cleveland, Cleveland. Society address: Union Commerce Bldg., Cleveland 14. Managing director: Lowell D. Ryan.

January 26-28, Truck-Trailer Manufacturers Association: Annual meeting. Edgewater Gulf hotel, Edgewater Park, Miss. Association address: 1024 National Press Bldg., Washington. Managing director: John B. Huise.

January 26-30, American Society of Heating & Ventilating Engineers: International heating and ventilating exposition. Grand Central Palace, New York. Society address: 51 Madison Ave., New York 10. Secretary: A. V. Hutchinson.

February 16-19, American Institute of Mining & Metallurgical Engineers: Annual meeting. Hotel Statler, Los Angeles. Institute address: 29 W. 39th St., New York 18. Secretary: E. H. Robie.

FREE

WALL CHART

(28" x 54")

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Here is Nicholson's up-to-date Wall Chart comprising a quick, orderly visualization of "key" types of files in each of the groups popularly known as:

MILL (or SAW) FILES

MACHINISTS' FILES

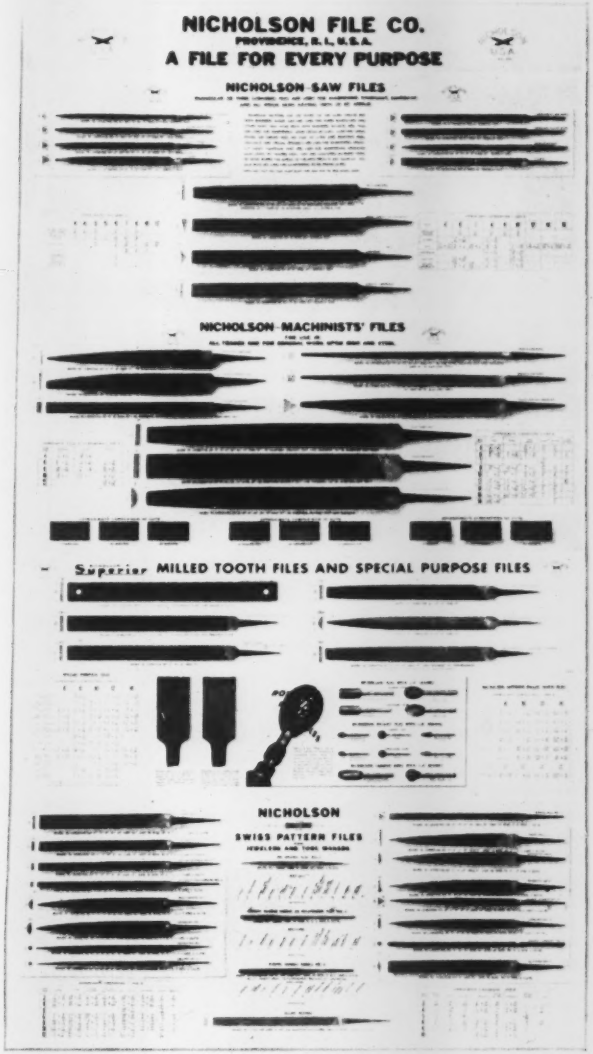
MILLED CURVED-TOOTH and SPECIAL PURPOSE FILES

SWISS PATTERN FILES

ROTARY POWER FILES and BURS

The Chart (durably cloth-backed) is a valuable aid to modern production speed and shop economy through the selection of *The right file for the job.* Purchasing, production and toolroom heads find it a most helpful guide. Trainees learn rapidly through its use with shop-school talks and demonstrations.

USE YOUR BUSINESS LETTERHEAD in writing to us for your free copy of the Chart.



Also free with each Wall Chart: A copy of the famous Nicholson book, "File Filosophy"

—a valuable 48 page illustrated "textbook" on kinds, use and care of files. Also elaborates on the characteristics of many of the files shown in this Chart.

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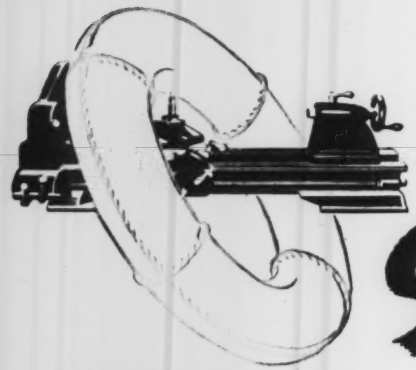

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Life of production equipment and machinery is prolonged, and down time avoided by the ease and speed with which Bunting Standard Stock Bearings, Electric Motor Bearings and Precision Bronze Bars can be obtained and employed.

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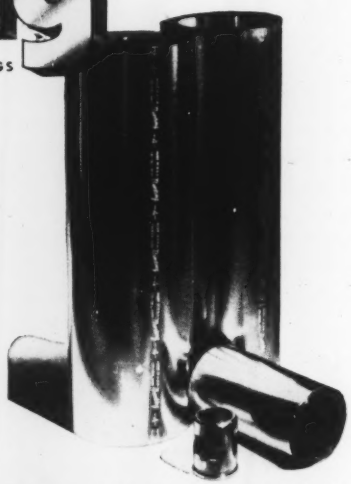

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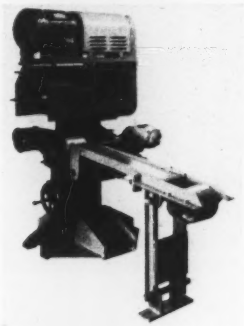
NEW PRODUCTS and equipment

Reply cards on page 173 will bring you more information on any new products and equipment in this issue

Conveyorized Grinding Machine

. . . grinding speed: 6500 fpm

This conveyorized grinder can be modified for a wide range of production grinding, finishing or polishing operations. Parts to be ground are placed in jigs or holders attached to the heavy duty belt



conveyor at proper intervals, then are carried under the wheel, which can be contour-dressed to suit the job.

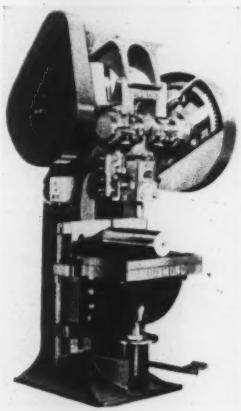
After grinding, parts dump automatically into tote boxes. Adjustable drive permits compensation for wheel wear to maintain grinding speed of 6500 fpm. In one application, machine snags rocker arm castings at speeds to 2000 per hour. Smith Power Transmission Co., Dept. ST, 1545 E. 23rd St., Cleveland 14, O.

USE REPLY CARD—CIRCLE No. 1

Heavy-Duty Horn Press

. . . available plain or geared

Forty-ton horn press features heavy-duty frame and adjustment ease. Press is available either plain or geared. It has 3½-inch diameter of shaft at main bearings, 18 x 24-inch table area of bolster and 10 x 14-inch opening in bed. Horn hole and length is 6 x 19 inches. The press operates



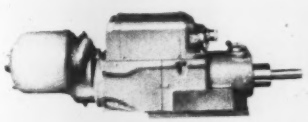
at 50 to 100 strokes per minute. Diamond Machine Tool Co., Dept. ST, Pico, Calif.

USE REPLY CARD—CIRCLE No. 2

Hydraulic Drill Unit

. . . handles heavy-duty jobs

Air-powered hydraulic drill unit is designed for heavy-duty drilling, tapping, reaming, spot facing, hollow milling and similar operations. Tool features quick setup,



hydraulic feed control, fast traverse to positive stops. Maximum stroke is 6 inches and it has 1800-pound thrust with 80 psi air pressure. It can accommodate a maximum 5 hp motor and 1⅛-inch drill.

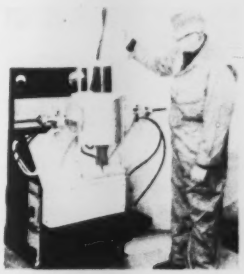
Stroke length control is exerted by positive micrometer stop infinitely adjustable from 0 to 6 inches. Depth can be held to within 0.0005-inch. Another feature: Adjustability rate for rapid approach and return is infinite from 0 to 180 inches per minute. Delta Power Tool Division, Rockwell Mfg. Co., Dept. ST, 400 N. Lexington Ave., Pittsburgh 8, Pa.

USE REPLY CARD—CIRCLE No. 3

Investment Casting Furnace

. . . chamber, transformer joined

Investment casting furnace combines melting chamber and transformer into a single unit. Chamber has a two-piece refractory seated in a granular insulation,



provided with tubular entrances for electrodes and for pouring. Investment mold clamps onto the shell face plate by compressed air.

Operator pours heat by inverting furnace and allowing molten metal to run into the clamped-on mold. When casting solidifies, air pressure is released and mold removed before returning furnace to melting position. Average melt time: 6 pounds in 9 minutes when casting alloy steels of Stellite variety.

Handling heavy coiled wire with Towmotor at Jones & Laughlin Corp., Pittsburgh, Pa.

give production a big hand...

Towmotor makes one man ten times better when it comes to handling heavy loads at top-production speed. Output soars and handling costs sink accordingly . . . gains that fast cancel Towmotor's modest first cost. From then on it's a steady pay-off because there's real staying power built into Towmotor Mass Handling Equipment. "Man Hour Thieves" tells the whole timely story. Write for your copy and name of your nearest Towmotor Representative to: Towmotor Corporation, Div. 16, 1226 E. 152nd St., Cleveland 10, Ohio.

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THE ONE-MAN-GANG
R

FORK LIFT TRUCKS and TRACTORS
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NEW PRODUCTS and equipment

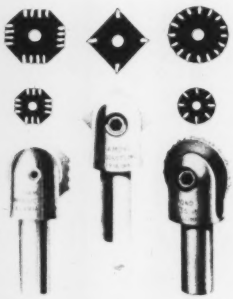
Average elapsed time per heat is 12 minutes. Detroit Electric Furnace Division, Kuhlman Electric Co., Dept. ST, 2700 Garfield Blvd., Bay City, Mich.

USE REPLY CARD—CIRCLE No. 4

Profile Diamond Dressers

. . . take all wheel types, sizes

Profile dresser line includes round, square and octagonal diamond types. Their design is said to provide a versatility that is preferable to the single point diamond because they dress every type and size of grinding wheel. Application is provided for straight, form and profile dressing on centerless, cylindrical, surface and internal grinders. Tools can be used in either a vertical or horizontal position. Diamond Products Inc., Dept. ST, 329 Prospect St., Elyria, O.



USE REPLY CARD—CIRCLE No. 5

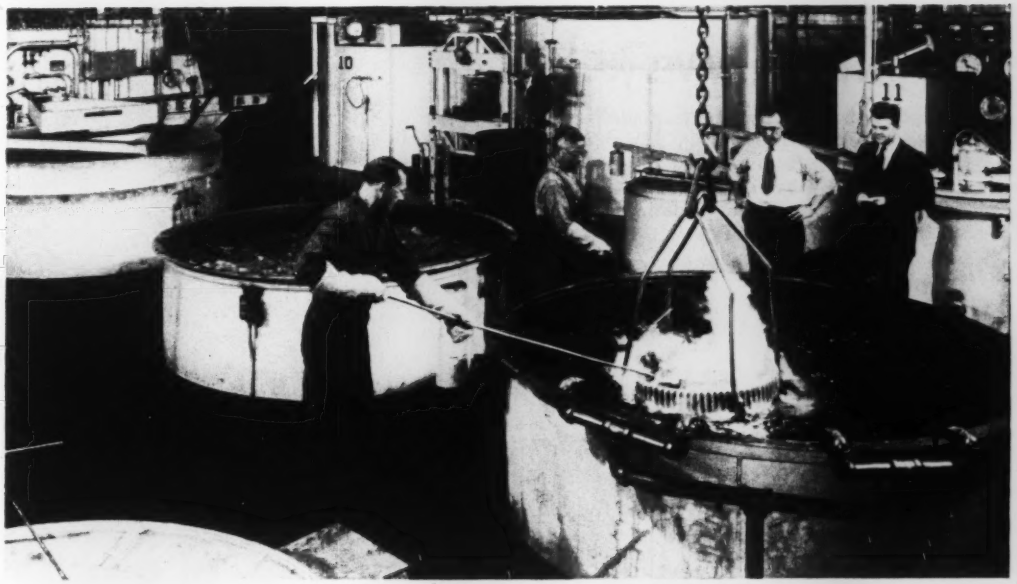
Band Sawing Machine

. . . work fed from the front

Large capacity band saw has wide speed-range designed principally for rapid, heavy duty work. It handles all ferrous and nonferrous metals in the complete range of shapes. Machine differs from conventional band sawing units because blade is twisted 90 degrees from regular position. Work is fed to the blade from machine's front. Thus, length of stock that can be cut is not limited by throat capacity.

Saw is readily convertible to conventional high or low speed, straight or contour work. Model accommodates a 15½-inch work

Want deeper hardness on low alloy steels without distortion or cracking?



switch to GULF SUPER-QUENCH

GULF SUPER-QUENCH is exceptionally fast — produces deep and uniform hardness on all types of alloy steels. Deeper and more uniform than is possible with conventional quenching oils. It is particularly effective on the substitute steels which have low hardenability characteristics.

Add the fact that GULF SUPER-QUENCH has the same minimum tendency to distort and crack as conventional quenching oils and you can see why GULF SUPER-QUENCH is often the difference between successful quenching and a high percentage of rejects.

No matter what alloys or shapes you quench, you will gain from the greater quenching power of GULF SUPER-QUENCH. Ask a Gulf Sales Engineer for further details on this outstanding quenching oil. Write, wire, or phone your nearest Gulf office.

GULF SERVES INDUSTRY

GULF OIL CORPORATION
GULF REFINING COMPANY
Pittsburgh 30, Pa.

THE IMPROVED

Exide-Ironclad

BATTERY

GIVES you more...SAVES you more

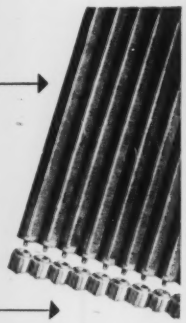
It gives you more of everything that adds up to top performance, long battery life . . . saves you more through low over-all costs. Outstanding new features, including the polyethylene insulating tube sealer, *more than ever before*, make Exide-Ironclad YOUR BEST POWER BUY . . . AT ANY PRICE.

HERE'S WHAT YOU GET

Rapid, accurate handling . . .
Uniform rate of handling . . .
High availability . . . Low operating costs . . .
Low maintenance costs . . . Low depreciation costs . . .
High maneuverability . . . Safe handling

AND HERE'S WHY

IMPROVED POSITIVE PLATE CONSTRUCTION. The long-life grids now contain SILVIUM—an alloy of silver, lead and other components—which make them highly corrosion-resistant.



NEW POLYETHYLENE INSULATING TUBE SEALER of acid-proof, non-corroding plastic. It fits snugly into slotted tubes of positive plates, and reduces loss of active material. Even the small sediment deposit of the past is reduced 50%. Thus more active material remains available, and the high battery capacity is maintained for a longer working life.

PLUS THESE EXTRAS

IMPROVED NEGATIVE PLATES for higher electrical efficiency.

NEW SEALING COMPOUND provides permanent seal between jar and cover.

SEAMLESS SHOCK-PROOF JAR, of high quality rubber, combines tensile strength and elongation for long-life and heavy-duty service.

NEW UNBREAKABLE PLASTIC VENT PLUGS of polyethylene.

TYPES, SIZES AND CAPACITIES for all kinds and makes of battery-electric trucks—hand and rider.

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Philadelphia 2
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DEPENDABLE BATTERIES FOR 64 YEARS
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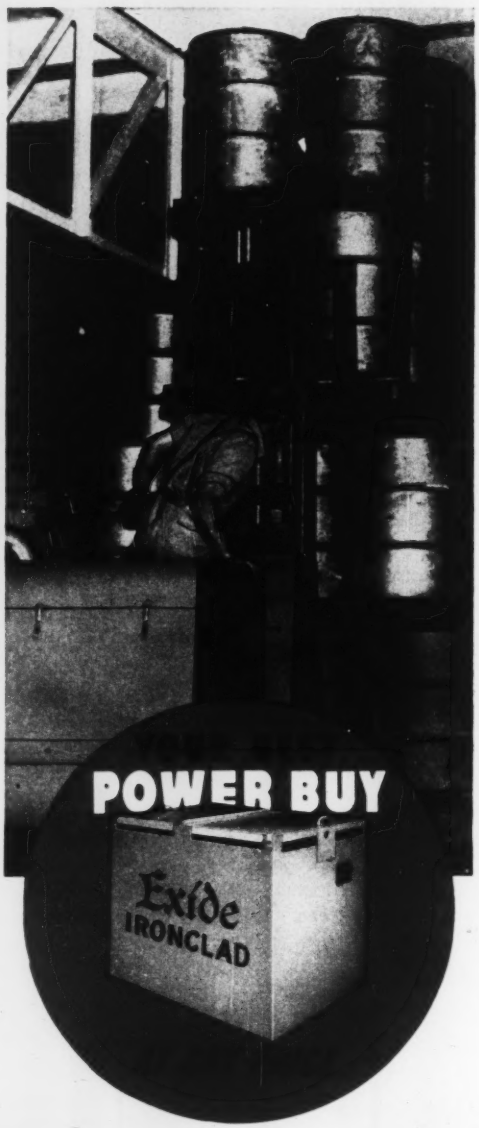
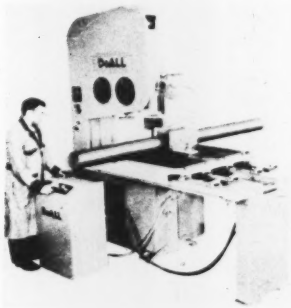
EXIDE-IRONCLAD and SILVIUM Reg. T. M. U. S. Pat. Off.



thickness under guide and 9½-inch thickness at the column. Work table, 40 x 48 inches, is powered hydraulically and handles work to



2000 pounds. DoAll Co., Dept. ST, 254 N. Laurel Ave., Des Plaines, Ill.

USE REPLY CARD—CIRCLE No. 6

Metal Slitting Attachment

. . . shears 20-gage sheet

Slitting attachment provides power shearing for sheet metal 20 gage or lighter, handles any length from 1 inch. Tolerance of 1/32-

inch is held on an 8-foot sheet.

Attachment fits the manufacturer's models 20 and 22 and the portable model 24. Lockformer Co., Dept. ST, 4615 W. Roosevelt Rd., Chicago 50, Ill.

USE REPLY CARD—CIRCLE No. 7

Rectifier Unit

. . . for low voltage regulation

MagniVolt, an alternating to direct current rectifier, operates on 115 v, single phase, 60 cycle current. The unit's magnetic amplifier contains no moving parts or vacuum tubes. It is resistant to shock and wear and is insensitive to frequency and temperature changes. Inet Inc., Dept. ST, 8655 S. Main St., Los Angeles 3, Calif.

USE REPLY CARD—CIRCLE No. 8

Magnifying Spectacles

. . . for close inspection work

Operator is aided by wearing magnifying spectacles where careful inspection requires magnification or close tolerance work strains the eyes. Employing the same optical system as a pair of binoculars or a telescope, spectacles afford 2x magnification with clarity. Armco Mercantile Co., Dept. ST, 221 N. LaSalle St., Chicago 1, Ill.

USE REPLY CARD—CIRCLE No. 9

Ground Clamp

. . . rated capacity: 200 amp

Model GC-200 cub arc welding ground clamp has a rated capacity of 200 amp. It features a protruding upper lip for extra lever-

CLEAN BETTER, FASTER

Chydro

Quickly and easily connected to any ¾", 60 p.s.i. steam outlet, the portable Clayton Hydro Steam Cleaner provides a heavy-duty cleaning and sterilizing system. It employs steam to pick up, mix and deliver a driving spray of properly balanced cleaning or sterilizing solution at controlled pressures and temperatures. *Where it hits, it's clean.* The toughest cleaning job is completed more thoroughly in one quarter the time required by obsolete hand cleaning methods. Mail the coupon for a FREE, convincing demonstration in your own plant.

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Send us free, "The Gun that KILLS Dirt" and arrange to demonstrate the Hydro Steam Cleaner.

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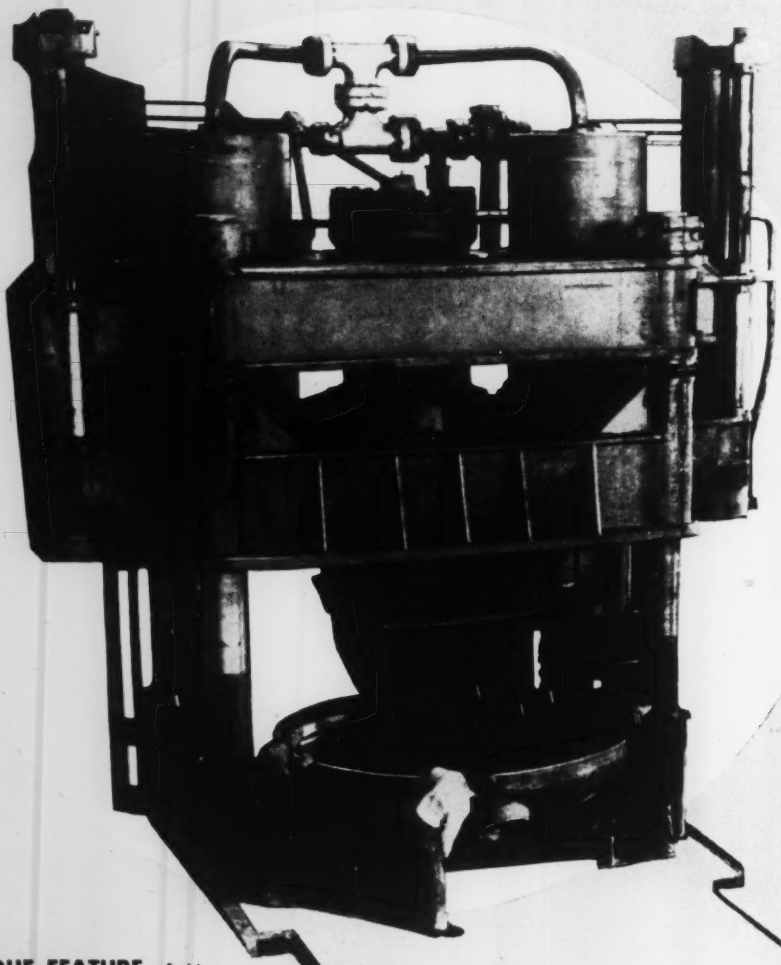

UNIQUE FEATURE of this big Baldwin press is an arrangement for mounting clamping cylinders on the underside of the upper platen. Acting as cushioning cylinders, these permit inverted forging with split dies—eliminate jamming the plug center piece with scale.

BALDWIN · BLH · LIMA-HAMILTON

BALDWIN

LUKENS forges a head with its newest BALDWIN press

Thanks to its Baldwin-built 2000-ton press, Lukens now can produce deep-drawn shapes to close tolerances in a single operation. Through its extensive pressing facilities, headed by this new 2000-tonner, Lukens' customers get better heads and heavy plate shapes with other important benefits.

Ask Lukens' production people how they like this Baldwin press. They'll tell you about versatility—the ease of operation—the open design that makes it easy to reach every part—the simplicity of maintenance.

An outstanding feature, they report, is the exceptional rigidity. There's no distortion under tough jobs. Which, of course, pleases the press operators, for they can more easily hold close tolerances.

Like most large Baldwin presses, this 2000-tonner represents a combination of our ideas and those of Lukens' experts. This is typical of the way we blend our design experience with that of customers' to come up with *better presses.*

—and explains why most of the large flanging presses produced each year are Baldwin-built.

Because of their rigidity—and other outstanding features—you'll find a lot of Baldwin hydraulic presses in the Lukens' shops.

- **Baldwin 1500-ton flanging & piercing press**
- **Baldwin 800-ton press**
- **Baldwin 500-ton sectional flanging press**
- **Baldwin 44-ton hydraulic slab-holding fixture for edgewise welding of clad-steel flanges**
- **Baldwin bending roll**
- **Baldwin 125-ton gap press**
- **Baldwin 36' plate planer to bevel steel plate prior to welding**
- **Baldwin 75-ton press for flattening ring flanges**

The Baldwin 2000-ton press has a moving-down platen operated by two 40-inch rams and carries a 40-inch, 1000-ton double-acting center ram. A stripping cylinder is mounted inside the bottom platen with a 600-ton cushioning cylinder located below.

-LIMA-HAMILTON

General Offices: Philadelphia 42, Pa. • Offices in Principal Cities

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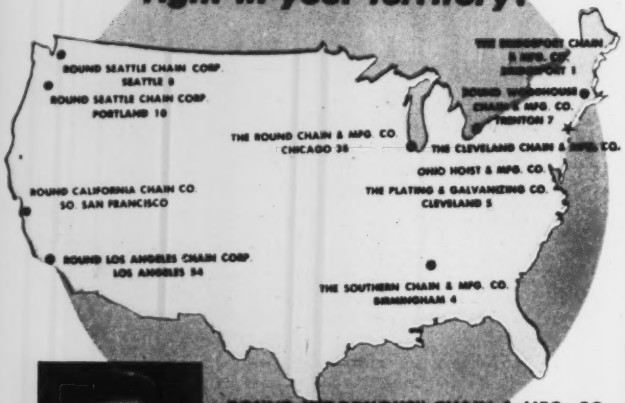


W. J. KEENAN

ROUND WOODHOUSE CHAIN & MFG. CO.— established in 1884 — joined the nationwide Round organization in 1936. Under the management of Willis J. Keenan, who has been a Round Chain man for 15 years, Woodhouse now offers *a complete line* of welded and weldless chain, slings, chain hoists, electric hoists and trolleys to the important Middle Atlantic market. *Sold exclusively through distributors and wholesalers.*

NEW PRODUCTS and equipment

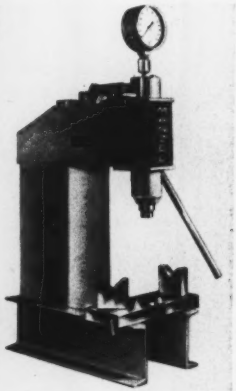
age in applying clamp, wide jaws for added conductivity, serrated lower jaw that removes rust and scale as clamp is applied. Tweco Products Co., Dept. ST, Box 666, Wichita, Kans.

USE REPLY CARD—CIRCLE No. 10

Bench-Type Arbor Press

. . . fits wide application range

Wide uses for this bench-type arbor press are found in toolroom, laboratory or machinery overhaul department. Applications include straightening, material testing, bending, bushing or bearing removal and replacement. Gage registering in tonnage is available as optional equipment. V blocks and bearing plate are standard. Manzel, Dept. ST, 315 Babcock St., Buffalo 10, N. Y.



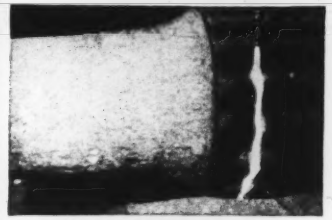
USE REPLY CARD—CIRCLE No. 11

Phosphating Line

. . . for organic finishing

Turcoat line is comprised of five materials for the proper coating of any type of organic finishing: Turcoat 3540, provides thin, smooth, tight phosphate coating on iron, steel or zinc as bond for paint or metal drawing; 3520, gives substantial phosphate coating on iron or steel as foundation for oil, paint or other organic finishes; 3420, cleans, passivates iron and steel in one operation; 3557, gives phosphate antifriction coating for iron or steel moving parts; 3560, gives chemical coating on

A 31-TON INGOT *SLICED* IN 35 MINUTES!



GOING... Cropping massive ingots to workable size is a routine operation at the Canton, Ohio plant of Industrial Forge & Steel, Inc., a subsidiary of the Barium Steel Corporation. Shown here is a 62,500 pound corrugated steel ingot with an Airco No. 6850 heavy duty torch in position and starting the cut. Cut must be exact to produce a rough forging of specified weight.

GOING... This section was first heated to 600°F. After five minutes of torch preheating, the 6850 was put into action at a forward speed of approximately 1.5 inches per minute. Halfway through this huge section, the cut is clean and symmetrical . . . yet the operation is virtually unattended!

GONE! Note the smooth "face" on the severed ingot. This photo was taken 35 minutes later . . . and the ingot is now some 21,524 pounds lighter — "precision-cropped" to a weight tolerance. The Airco 6850 will do a similar job on sections that range from a foot in diameter — to a full six feet . . . and tips are available for acetylene and other fuel gases. For details contact the nearest Airco office!

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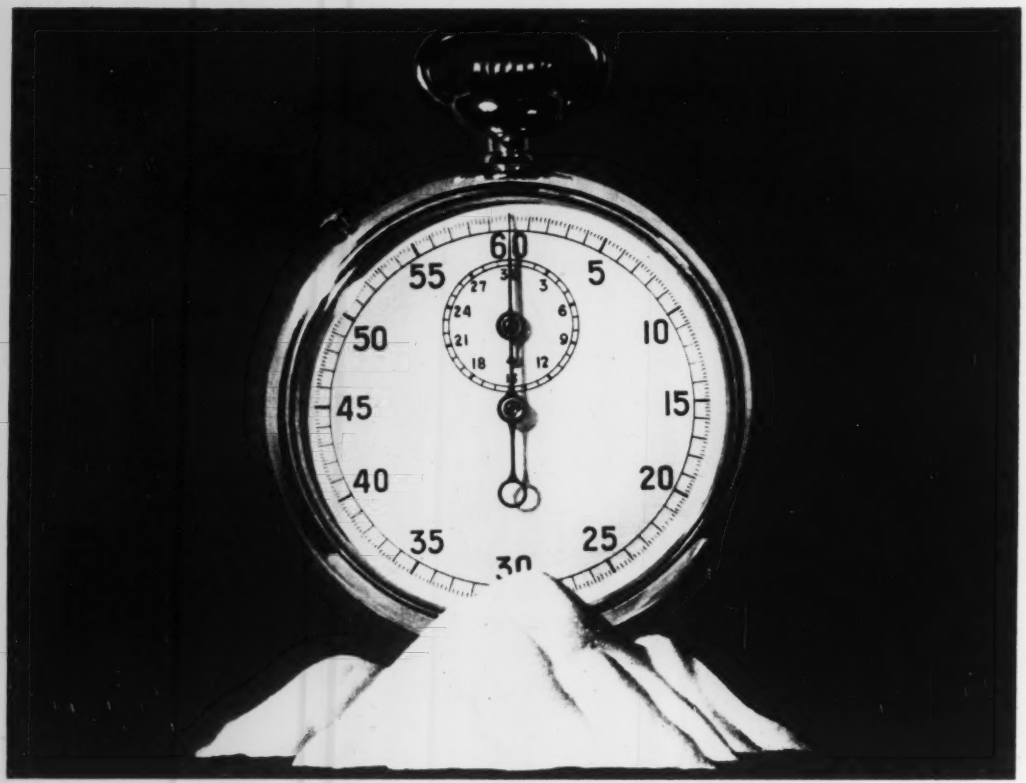

How to speed your hot repairs!

You can cut excessive down time for electric or open hearth bottom repairs when you use dependable Permanente 84 *periclase* ramming and patching mix.

Because patented Permanente 84 is easy to use, faster hot repairs are possible. And because Permanente 84 gives superior bottom performance, fewer repairs are required between heats.

Processed from high-purity periclase derived from sea water magnesia, Permanente 84 provides an unbeatable combination of high refractoriness and chemical resistance. Its high density and chemical purity minimize penetration of slag and metals.

It will pay you to specify Permanente 84 for open hearth and electric furnace rebuilds as well as for bottom, bank and tap hole maintenance.

Your Kaiser refractory engineer will give prompt attention to your refractory problem — will offer, where desired, research, design and installation service to give you maximum production most economically. Write for descriptive literature on Permanente 84 and the companion ramming mix, Permanente 165. Principal sales offices: *Chemical Division*, Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, California. First National Tower, Akron, Ohio.

Kaiser Chemicals

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Basic Refractory Brick and Ramming Materials • Dolomite • Magnesia • Magnesite • Alumina • Periclase

terneplate and other difficult to coat nonferrous metals as a bond for paint. Turco Products Inc., Dept. ST, 832 E. 62nd St., Los Angeles 1, Calif.

USE REPLY CARD—CIRCLE No. 12

Diesel Power Truck

. . . means low-cost operation

Continuous-duty diesel electric power is available for 4000-pound fork models. It can be applied on platform models up to 10,000 pounds. Some advantages indicated: Low operating cost, minimum of maintenance, long life expectancy.

Model N fits sitdown-type trucks without need for alterations. Unit is complete with fuel tank and starting battery for immediate conversion. Ready-Power Co., Dept. ST, 3826 Grand River Ave., Detroit 8, Mich.

USE REPLY CARD—CIRCLE No. 13

Vise Soft Jaws

. . . with built-in magnets

By utilizing built-in permanent magnets, soft jaws are snapped into position quickly and easily. A two-way V-groove locks the work in, holding it in any position desired, regardless of size or shape. Magne-Grip Tool Co., Dept. ST, 4900 W. Madison St., Chicago 44, Ill.

USE REPLY CARD—CIRCLE No. 14

Liquid Rust Inhibitor

. . . for wet blasting machines

Anarust is a liquid rust inhibitor for wet blasting machines. It is a material of organic composition and contains no chromates. It

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through USEFULNESS...

There's no end to the usefulness of the Clark line of fork-lift trucks, powered hand trucks and industrial towing tractors . . . special attachments facilitate quick switching from one job to another . . . no idling while "waiting for work" . . . odd sizes and shapes handled easily and safely . . . your choice of power types—gas, diesel or electric battery.

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Clark Equipment saves time . . . multiplies manpower . . . reduces handling time. Clark high-tiering increases usable warehouse space . . . cuts storage costs. And the many important Clark features plus Clark precision engineering insure remarkably low operating costs.

through SERVICE...

Clark Equipment gives service . . . years of it. But remember, the equipment that *gives the most* service is that which *gets the best* service. That's why you'll always find a Clark Service Dealer near you capable of handling the most complex repair or overhaul job . . . with a line of genuine Clark replacement parts . . . and a crew of factory-trained experts to serve you . . . *promptly.*

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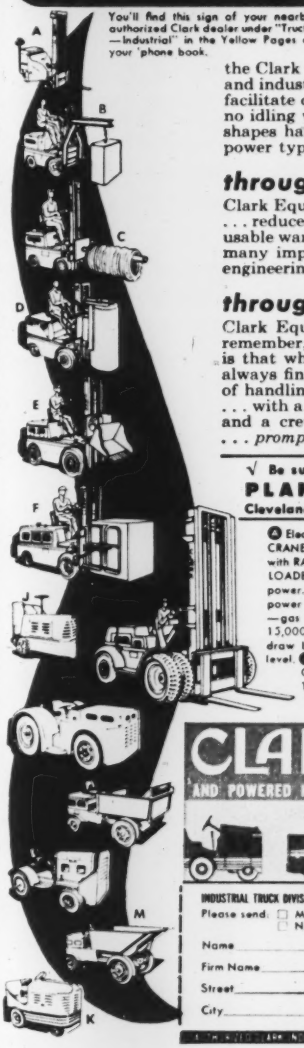

A Electric-Powered HAND TRUCK with Stacker. B TRUCLOADER with CRANE Attachment—1000 lb. cap.—gas or electric power. C CLIPPER with RAM Attachment—2000 lb. cap.—gas or electric power. D CARLOADER with BARTEL Device—3-4-5000 lb. cap.—gas or electric power. E YARDLIFT with SHOVEL Attachment 2-4-6000 lb. cap.—gas power only. F UTILITRUC with CLAMP Attachment 6-7-10,000 lb. cap. —gas or electric power. G YARDLIFT—150 with Standard Forks 15,000 lb. cap.—gas power only. H CLARKTOR—100-10,000 lb. draw bar pull. J CLARKTOR—47 to 104 tons hauling capacity on level. K CLARKETTE—5-10 tons hauling capacity on level. L CLARKAT—42 to 58 tons hauling capacity on level. M TRUCTRACTOR—Dump model 4000 lbs. capacity. M TRUCTRACTOR —Tip-model 4000 lbs. capacity.

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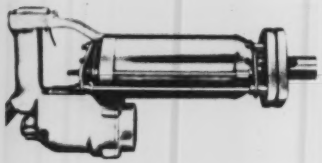
is completely soluble in hard or soft water at 20° C. Inhibitor is an effective agent in retarding rust on cast iron or steel parts being cleaned or washed after wet blasting. American Wheelabrator & Equipment Corp., Dept. ST, 1157 S. Byrkit St., Mishawaka, Ind.

USE REPLY CARD—CIRCLE No. 15

Electric Hammer Drill

. . . speeds quantity drilling

This 2-inch capacity electric hammer drill, model 26-RO, speeds quantity hole drilling in concrete



and masonry. It combines power of electromagnet hammer with automatic rotation of a spiral fluted, carbide-tipped drill bit.

Simple rubber ratchet mechanism uses recoil of each hammer piston blow to turn the bit slightly. At 3600 blows per minute, bit is rotated with considerable torque at proper speed. Automatic rotation also eliminates manual quarter-turning of drill bit, reducing operator fatigue. Syntron Co., Dept. ST, Homer City, Pa.

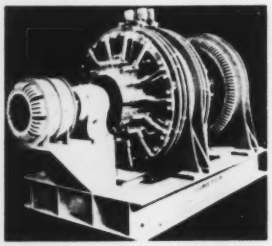
USE REPLY CARD—CIRCLE No. 16

Motor Generator Line

. . . commutation improved

Redesigned line of motor generators features improved commutation, increased accessibility, higher overall efficiency. Generator and exciter brushes, coils and commutator are accessible for inspection, cleaning or removal without removing other components. Field poles and windings can be removed quickly by removing two holding studs.

Oversize split sleeve bearings adjacent to commutators assure smooth operation and permit overloading without heating. Prime mover is a direct-connected low speed, heavy-duty synchronous motor with either 80 per cent leading or unity power factor. Chan-



deysson Electric Co., Dept. ST, 4084 Bingham Ave., St. Louis 16, Mo.

USE REPLY CARD—CIRCLE No. 17

Time Delay Relay

. . . needs no warm up

MEK-1803 electronic time delay relay needs no warm up, has instantaneous reset, long tube life, dust tight relays and visible operating contacts. Relays are the only

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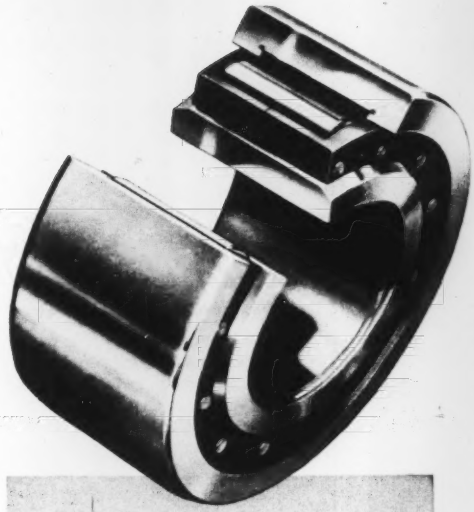
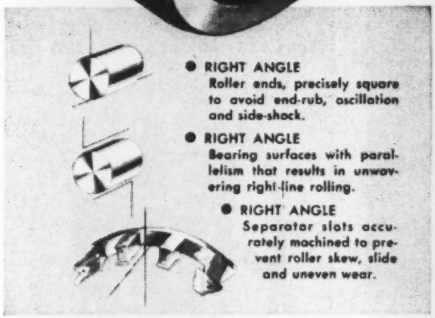




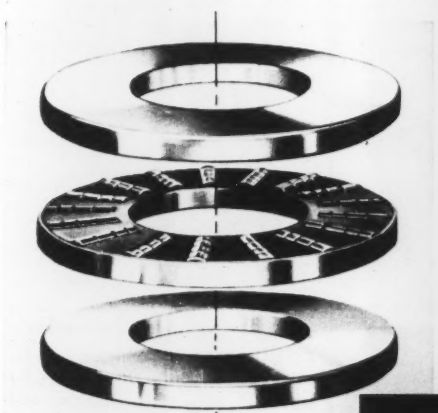
- **RIGHT ANGLE** Roller ends, precisely square to avoid end-rub, oscillation and side-shock.
- **RIGHT ANGLE** Bearing surfaces with parallelism that results in unwavering right-line rolling.
- **RIGHT ANGLE** Separator slots accurately machined to prevent roller skew, slide and uneven wear.

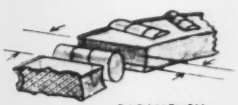
In a Rollway Radial Bearing there's no wedging of the rollers . . . no pinch out . . . far less roller end rub and wear back. Rollway's *Right Angle Design* reduces rubbing friction to a minimum — results in less service attention, longer life expectancy under heavy duty service.

In Thrust Bearing applications, accurate parallelism between the rollers and the matched thrust plates is repeated in the parallelism between the separator slots and the rollers themselves — all adding up to quietness, equalized wear and longer life.

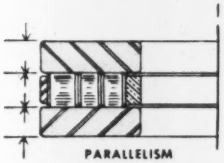
Our complete engineering and metallurgical services will gladly work with you on your problems. Simply write or wire any sales office. No cost. No obligation.

Rollway Bearing replacements are available through authorized bearing distributors in principal cities. Consult your classified 'phone directory.





PARALLELISM



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When the products you make call for a special fastener . . . to add extra holding strength, simplify design and production requirements or to cut costs . . . you'll find that it pays to call us in. Circle Ⓑ fasteners, individually designed to your jobs, are made by modern methods to meet volume demands.

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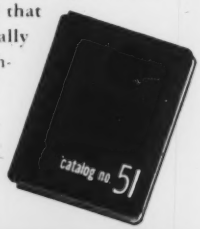


NEW PRODUCTS and equipment

moving parts in the timer and being of plug-in design, are readily changed when necessary. Either a maintained or momentary contact can be used to start timing interval. Machinery Electrification Inc., Dept. ST, 98 Union St., Worcester 8, Mass.

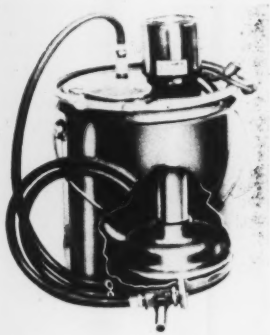
USE REPLY CARD—CIRCLE No. 18

Self-Contained Coolant System

. . . has one moving assembly

This self-contained cooling pump system uses only one moving assembly; it has no gears or other close-fitted parts to wear or jam. Flow-control valve produces instant adjustment ranging from 0 to 400 gph.

Capacities: 400 gph at zero head; 300 gph at 2 feet; 225 gph



at 4 feet; and 200 gph at 6 feet. Container is a 5-gallon tank with corrosion-resistant lining. Samuel S. Gelber Co., Dept. ST, 162 N. Clinton St., Chicago 6, Ill.

USE REPLY CARD—CIRCLE No. 19

Flat Surface Grinder

. . . no setup, simple operation

Flat surface type passover machine grinds flatness on cylinder heads, blocks, pipe flanges and similar parts to 0.001 to 0.0015-inch with no setup. Movement of the 14-inch wheel vertically 0.003 to 0.005-inch in grinding action helps assure fast, cool grinds. Wheels are available for all types of metals. Foot control below machine positions wheel for proper cut.

Combinations of 3 hp, single or

Picture above of the wreck in which the tractor was demolished, while the tank Trailmobile of high-strength Otiscoloy held its cargo intact; (below) the same trailer, thirty days later, after being rebuilt.

J&L OTISCOLOY HIGH STRENGTH STEEL *plus* TRAILMOBILE CONSTRUCTION

Saved the day for this cargo of gasoline

When forced off a Missouri highway, this gasoline tank Trailmobile went over a high embankment, turned over twice and landed upside down—*but did not lose a gallon of its highly-inflammable cargo.* The tractor pulling the Trailmobile was completely demolished.

Trailmobile Inc., renowned for superior trailers, made a smart move when they selected high-strength J&L Otiscoloy Steel for Trailmobile construction. J&L Otiscoloy (with twice the yield strength of mild steel) will stand up better and longer under the severe impact and fatigue conditions of modern trailer operation.

In addition, J&L Otiscoloy's great strength permits Trailmobile to employ lighter weight sections in the construction—thereby cutting deadweight—and permitting Trailmobile trailers to haul larger payloads within the legal weight limits.

Finally, equipment builders such as Trailmobile have found that the ease of welding Otiscoloy lends itself to their production techniques and helps assure a strong, sound, finished product (as demonstrated in the photo above).

Why don't you check into the possibility of using J&L Otiscoloy to advantage in your operation? Send for a free copy of our booklet: "J&L Otiscoloy—The Transportation Steel." Or get in touch with the J&L representative nearest you.

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PITTSBURGH 30, PA.

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404 Liberty Avenue • Gateway Center, Pittsburgh 30, Pa.
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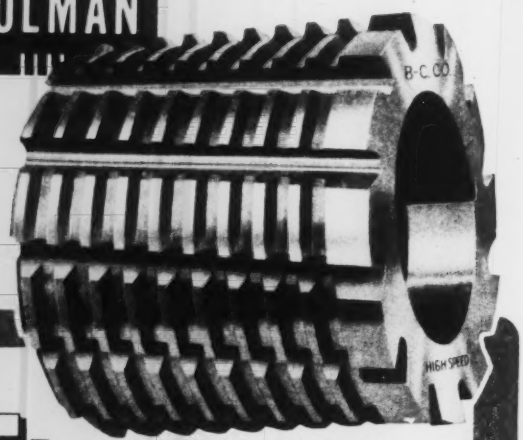


Thread Milling Cutters

ARE BUILT TO FIT THE JOB

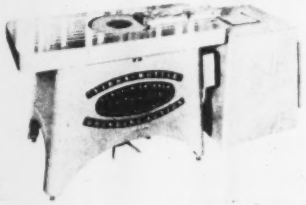
Ask our engineers to quote limits of accuracy and production estimates, using ground or unground, straight or helical fluted thread milling cutters for your applications.

BARBER-COLMAN COMPANY
882 ROCK STREET
ROCKFORD, ILLINOIS

NEW PRODUCTS and equipment

three-phase motors, or 5-hp three-phase motors are available. Table sizes are 24 x 50 and 27 x 72 inches.

The dual cyclone type dust



collector equipped with three fiber filters is a standard part. Peterson Welding Laboratories, Dept. ST, 1423 Virginia, Kansas City 6, Mo.

USE REPLY CARD—CIRCLE No. 20

Stepping Switch

. . . self-interrupted operation

Model 27000 bi-directional stepping switch features self-interrupted, completely reversible operation that makes it suitable for use in high-speed differential counter and servo mechanism designs. It is also convertible to a stepping motor for special servo and control applications. Consolidated Engineering Corp., Dept. ST, 300 N. Sierra Madre Villa, Pasadena 8, Calif.

USE REPLY CARD—CIRCLE No. 21

Versatile Power Tool

. . . grinds, drills, polishes

Portable power drill model 127 functions for grinding, drilling, polishing and sanding. Lightweight aluminum alloy housing makes the tool easy to handle. Universal alternating-direct current motor, hardened heavy pitched gears, geared chuck, built-in trigger type switch, and 500 rpm spindle speed

USE A **REPLY CARD**

Just circle the corresponding number of any item in this section for more information.

INFORMATION

AVAILABLE FOR THE ASKING

72. Flexible Coupling

De Laval Steam Turbine Co.—Crown couplings which distribute the load and compensate for stresses caused by misalignment of rotating shafts are described in 4-page illustrated bulletin 2200. Selection data are given to aid the application of couplings which are available in capacities from 1.7 to 415 hp per 100 rpm.

73. Air Conditioning Units

National Association of Fan Manufacturers, Inc.—Functions and purposes of four commonly accepted types of cabinet air conditioning units are graphically presented by means of chart drawing and tabular matter in 4-page illustrated bulletin No. 114. A specifications check list is included.

74. Circular Sawing Machine

Motch & Merryweather Machinery Co.—Two 4-page illustrated bulletins 375 and 475 give complete specifications and explain operating features of Nos. 3 and 4 circular sawing machines which will cut up to 12 and 16½-in. round steel stock respectively. Also shown are automatic saw blade sharpener and the segmental type saw blade.

75. Wear-Resistant Weld Metal

McKay Co.—Technical bulletin No. 8 discusses the operation and uses of Frogalloy M and Frogalloy C welding electrodes which are designed for applications which require weld metal that will withstand wear under impact with minimum deformation and without spalling or cracking. Complete application data and properties are charted.

76. High Frequency Heating

Lepel High Frequency Laboratories, Inc.—Detailed in two illustrated bulletins are model T-10-3 10-kw high frequency heating unit and portable 2-kw model. Both provide power for high frequency induction heating and are of electron tube type. Brazing, hardening, soldering, annealing and melting are some of the jobs that can be speeded with this equipment.

77. Materials Handling Grabs

Mansaver Industries—There's a size and type of grab that is particularly suited for practically every materials handling operation shown and described in 20-page illustrated catalog G-3. Whether it's plates, sheets, ingots, boxes, crate, bars, tubes, pipes, rods, bundles, barrels, rolls, coils, slabs or special containers, you'll find just the kind to do the job in this book. It's yours for the asking.

78. Portable Hardness Testers

Newage International, Inc.—Hardness of any size, shape and type of metal can be tested by Ernst portable metal hardness testers, described and illustrated in 4-page folder. Direct dial readings obtained are accurate to plus or minus 1.5 points Rockwell or 5 points Brinell. It tests on Rockwell A, B and C scales and Brinell low and medium scales.

79. Dial Gages

Nilsson Gage Co.—Specifications, applications, operation and components of dial bore, dial snap, dial groove, groove location and dial pitch diameter gages are covered in detail in 36-page illustrated catalog D. Much general gaging information is included and cross-sectional drawings are used to show gage settings, details and operation.

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80. Metal Processing

Turco Products, Inc. — Chemical processing operations used in the metalworking industry and Turco-made compounds that suit each operation are outlined and described in 16-page illustrated booklet A-33A. Much information is in chart form, including a Phosphating Reference Chart.

81. Utility Buildings

United Steel Fabricators, Inc. — Various styles and application of USF all-steel prefabricated utility buildings are described and illustrated in 8-page bulletin No. 1. Data on design features, steps in erection, method of assembly and how to plan the building for specific requirements are presented.

82. Portable Cutting Tools

Manco Mfg. Co. — Portable hand cutting tools ranging from lightweight hand cutters to high-capacity bolt cutters as well as tools for cutting such materials as steel rod, wire, fencing, steel strapping and high tension wire are described in 4-page illustrated bulletin No. 252.

83. Cellular Glass in Building

Pittsburgh Corning Corp. — Advantages of Foamglas (cellular glass) and its use in concrete sandwich panels in various types of buildings are covered in 4-page illustrated AIA file No. 37-B. Foamglas possesses insulating properties for floors, walls and roofs. Characteristics are given.

84. Corrosionproof Equipment

Maurice A. Knight Co. — Towers, sinks, trays, jars, and tanks made of Permanite, a furfuryl alcohol corrosionproof resin, are briefly described and illustrated in 4-page bulletin 6. Nozzle and flange data are given as well. Material is recommended for temperatures to 280° F and does not deteriorate with age.

85. Packaging Techniques

Hinde & Dauch Paper Co. — No. 9 in the Little Packaging Library is entitled "How to Prepak in Corrugated Boxes." Advantages of this method as well as step-by-step procedures for applying it to various products are explained in detail.

86. Press Brakes

Struthers Wells Corp. — Press brakes ranging in capacity from 100 to 500 tons and in sizes from 4 to 22 ft are subject of 8-page illustrated bulletin P-752. Full tabulated specifications and dimensions are featured on these presses which form up to ¾-in. thick mild steel plate. Bending, blanking, corrugating, shearing, curling, drawing, forming, notching, punching and trimming are among many applications.

EDITORIAL REPRINTS:

87. Heavy Forming Presses

Giant forming machines are taking shape after much speculation and discussion. Their impact on industry may bring changes in accepted production techniques. Design of these presses which will have capacities up to 50,000 tons and their effect on other plant operations are discussed by A. Zietlin in STEEL reprint "Heavy Presses Challenge Industry."

88. Plating Methods

STEEL reprint entitled "Plating Methods Explored" discusses some of the findings that resulted from experimental work done at Western Reserve University on electrode processes. These fundamental investigations covered by electrochemists at their Montreal meeting form basis for new and practical plating developments.

89. Automatic Attachments

Low efficiency on secondary operations that must be performed after a part has left the first machine can keep you in the "red." A Michigan specialty shop streamlined one of these nuisance operations calling for drilling of six No. 31 holes radially on each flat of a hex head. Output was upped 260 per cent. STEEL reprint "Automatic Attachments: Drill Makes Chips Fly" gives the story.

90. Buttweld Pipe Mill

"Watch Charm Mill Specializes on Small Diameter Buttweld Pipe" is title of STEEL reprint by J. D. Knox, plant editor, which describes Sharon Tube Co.'s continuous weld pipe mill designed to make ⅛-, ¼- and ⅜-in. buttweld sizes in the full range of standard extra heavy and galvanized grades. Pipe is delivered to hot saw and cooling bed at rate of 700 fpm.

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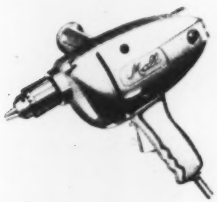
combine for efficient results.

For grinding and drilling, the model is equipped with 10-foot three-conductor rubber covered



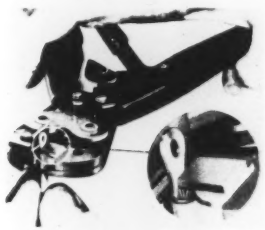
cord and plug. For polishing and sanding, it has the same equipment, without geared chuck. Mall Tool Co., Dept. ST, 7725 S. Chicago Ave., Chicago 19, Ill.

USE REPLY CARD—CIRCLE No. 22.

Terminal Crimping Tool

. . . positions stripped wire

Tool crimps solderless terminals accurately to wires having extremely thin insulation. Wire positioner is incorporated, acting to stop stripped wire in its proper place and prevent insulations from



being inserted into the terminal barrel.

Two other positioners help produce perfect terminations. A terminal guide orients terminal correctly in tool jaws and terminal barrel-stop positions terminal at proper crimping area. Aircraft-Marine Products Inc., Dept. ST, 2100 Paxton St., Harrisburg, Pa.

USE REPLY CARD—CIRCLE No. 23

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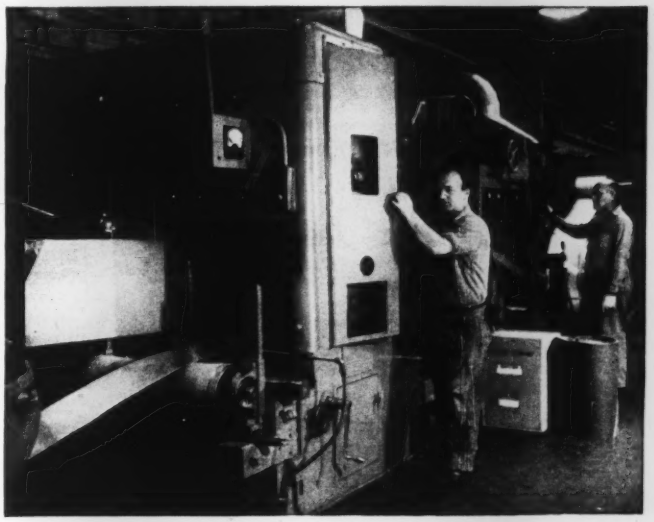
Manufacturer Cuts Costs 50%



with Jewel Brand Coated Abrasives

"Waste Barrel" Test Proves Profitable

Aided by the recommendations of Jewel Brand Abrasive Engineers, a prominent manufacturer now reports a record-breaking 50% production saving on the grinding and polishing of cold rolled stainless steel strip. Based on tests of used abrasive belt samples taken from plant waste barrels, the proper selection of longer-wearing, faster-cutting, Jewel Brand resin bonded belts has resulted in increased productivity at greatly reduced costs.

This could be your plant, your department, *your saving!* Make the easy, profitable "waste barrel" test now. Given a letter-size sample (including the joint if possible) of a used belt taken from your waste barrel, Jewel Brand Engineers usually can recommend a Jewel Brand Belt that will help you do a better job, faster, and for *less money.* You are under no obligation of any kind at any time. Simply fill in the coupon and send with used belt sample.

ABRASIVE PRODUCTS, INC. JEWEL ABRASIVES SOUTH BRAINTREE, MASS. U.S.A.

ABRASIVE PRODUCTS, INC.
511 Pearl Street
South Braintree 85, Mass.

HELP me complete the Waste Barrel Test!
Enclosed is a sample of used belt from our plant.

NAME _____

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TYPE OF PRODUCT _____ MATERIAL _____

WE USE APPROXIMATELY _____ BELTS PER MONTH _____

BELT LENGTH _____ BELT WIDTH _____

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

The Market Outlook

CLOSING weeks of the year find steelmakers bending every effort to satisfy the surprisingly sustained demand from all consuming directions. Burgeoning requirements of the nondefense industries, especially for the light, flat-rolled products, currently is the outstanding feature of the market. But continued strong pressure for items in short supply for months past, such as bars, plates and shapes, is just as significant a portent of continued high-level activity in steel for months to come.

ORDER BOOKS—The mills will enter 1953 with overloaded order books. First quarter production already is sold out in virtually all products. Little open tonnage, consequently, will be available for that period and what does appear will be diverted to high-rated military and defense projects. Nondefense consumers stand little chance of getting their requirements fully satisfied with carryover from fourth quarter claiming two-thirds of the period's output. This means heavy overflow into second quarter, and order books for that period on most products will not be opened for another couple of weeks. NPA estimates 23 million tons of finished steel will be available for all consumption in second quarter.

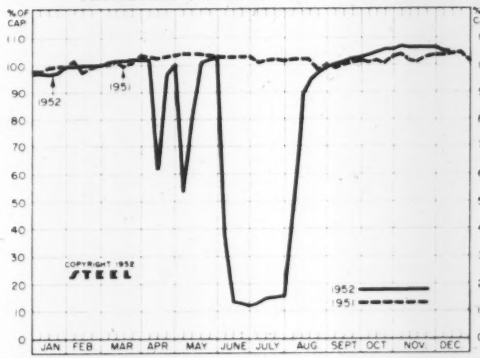
SHEETS SQUEEZED—All the signs point to sustained demand for hot and cold-rolled carbon sheets well into second quarter, possibly beyond. Specialties, such as silicon sheets, are in tighter supply and, demand for straight chromium stainless is reported increasing with further stringency in the nickel chromium grades indicated. Manufacturers of household appliances are seeking far more sheet and strip tonnage than they are getting and, in many instances, their inventories are at the lowest point in months. At the same time, automotive requirements for flat-rolled are pressing increasingly on the market.

OTHER PRODUCTS—No letup in demand for carbon bars, either hot-rolled or cold-drawn, is in sight. Military requirements for large and medium sizes will continue to squeeze supplies for commercial users well into the new year. Shortage of plates currently is so acute consumers are displaying growing interest in foreign offerings, though these are mostly in the lighter gages and command prices above the domestic market. Structural mills are booked up into first quarter but prospects for easier supply conditions in this area are brighter than in other products.

PRODUCTION—As yearend nears the furnaces are pouring steel in unprecedented volume. Output for the year is disappointing, estimated around 93 million net tons against the record 105-million-plus in 1951. But the drop was due entirely to loss of more than 18 million tons output during the work stoppages of April to August. Actually, 1952 ranks third in the production records and, from any normal standard, performance of the industry during the year was impressive. Currently, ingot operations are being pressed at above-capacity pace, the national ingot rate last week being estimated at 105 per cent. This is off ½ point from the preceding week, and is the lowest rate since mid-October.

RAW MATERIALS—Supplies of raw materials are considered adequate to support full operations into spring. Fear of an iron ore shortage due to strike-loss of some 24 million tons in lake shipments has about vanished. Movement of ore from head of the lakes in the 1952 navigation season, just closed, fell short of the 75-million-ton season target by only 89,202 tons. It was, however, 14,181,214 tons under that in the 1951 season. Stocks at furnaces and lower lake docks, estimated around 50 million tons, are thought sufficient to support full blast furnace operations beyond opening of 1953 navigation. Lake shippers now are setting their sights to bring down 106 million tons in the 1953 season. Scrap supplies also are considered ample with mill inventories reported in excess of 6 million tons as against 4.5 million a year ago.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Dec. 13	Change	Same Week 1951	Same Week 1950
Pittsburgh	104.5	1.5*	100	101
Chicago	108.5	0*	107	96
Mid-Atlantic	101	0	101.5	100
Youngstown	106	0	106	104
Wheeling	100	0.5	102	100
Cleveland	106.5	1.5*	108	101
Buffalo	106.5	0	104	104
Birmingham	106	0.5	105	100
New England	90	2	77	90
Cincinnati	93	0	102	102
St. Louis	96	3	82	86
Detroit	108	2	108	106
Western	107	0	98	105
Estimated national rate	105	0.5*	104	101.5

Based on weekly steelmaking capacity of 2,027,040 tons in 1952, 1,999,034 tons for 1951, 1,928,721 tons for second half, 1950, 1,906,268 tons for first half, 1950.

*Change from revised rate for preceding week.

The Metalworking Outlook—p. 67 Production-Engineering News—p. 103

Composite Market Averages

FINISHED STEEL PRICE INDEX: Bureau of Labor Statistics	Dec. 9 1952	Dec. 2 1952	Month Ago	November Average
(1947-1949 = 100)	130.6	130.5	130.5	130.5

AVERAGE PRICES (BUREAU OF LABOR STATISTICS)
Week Ended Dec. 9, 1952

Units are 100 lb except where otherwise noted below in parentheses. For complete description of products see insert following p. 28, STEEL, Sept. 8, 1952.

Rails	$3.775	Sheets, C.R. carbon	$5.275
Track spikes	6.650	Sheets, galv	6.915
Track bolts	9.958	Strip, C.R. carbon	5.100
Tie plates	4.775	Strip, C.R. stainless (lb)	0.325
Joint bars	4.925	Pipe, black, buttweld (100 ft)	7.090
Plates, carbon	4.150	Pipe, galv, buttweld (100 ft)	8.887
Structural shapes	4.200	Boiler tubes (100 ft)	31.663
Bars, tool steel (lb)	1.576	Tin plate (100 lb base box)	9.950
Bars, 3120 alloy	6.575	Terne plate (100 lb base box)	7.750
Bars, stainless (lb)	0.140	Wire, carbon, merchant	6.075
Bars, carbon	4.100	Wire, fence, galv	6.458
Bars, reinforcing	4.000	Nails (100-lb Kegs)	7.410
Bars, C.F., carbon	5.925	Wire, barbed (80 rod spool)	5.920
Sheets, H.R. carbon	4.125	Woven wire fence (20 rod roll)	13.720

FINISHED PRICE INDEX, Weighted: Calculated by STEEL*	Dec. 11 1952	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Index (1935-39 av. = 100)	181.31	181.31	181.31	171.92	129.28
Index in cents per lb	4.912	4.912	4.912	4.657	3.502

ARITHMETICAL PRICE COMPOSITES: Calculated by STEEL*					
Finished Steel NT	$110.98	$110.98	$110.98	$106.32	$76.09
No. 2 Fdry. Pig Iron, GT	55.04	55.04	55.04	52.24	36.89
Basic Pig Iron, GT	54.66	54.66	54.66	52.16	36.71
Malleable Pig Iron, GT	55.77	55.77	55.77	53.27	37.84
Steelmaking Scrap, GT	44.00	44.00	44.00	45.00	40.25

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composites, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS	Dec. 11 1952	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Bars, H.R., Pittsburgh	3.95	3.95	3.95	3.70	2.90
Bars, H.R., Chicago	3.95	3.95	3.95	3.70	2.90
Bars, H.R., del. Philadelphia	4.502	4.502	4.502	4.223	3.318
Bars, C.F., Pittsburgh	4.925	4.925	4.925	4.55	3.55
Shapes, Std., Pittsburgh	3.85	3.85	3.85	3.65	2.80
Shapes, Std., Chicago	3.85	3.85	3.85	3.65	2.80
Shapes, del., Philadelphia	4.13	4.13	4.13	3.918	2.954
Plates, Pittsburgh	3.90	3.90	3.90	3.70	2.95
Plates, Chicago	3.90	3.90	3.90	3.70	2.95
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.15	3.15
Plates, Sparrows Point, Md.	3.90	3.90	3.90	3.70	2.95
Plates, Claymont, Del.	4.35	4.35	4.35	4.15	3.15
Sheets, H.R., Pittsburgh	3.775	3.775	3.775	3.60-75	2.80
Sheets, H.R., Chicago	3.775	3.775	3.775	3.60	2.80
Sheets, C.R., Pittsburgh	4.575	4.575	4.575	4.35	3.35
Sheets, C.R., Chicago	4.575	4.575	4.575	4.35	3.35
Sheets, C.R., Detroit	4.775	4.775	4.775	4.55	3.70
Sheets, Galv., Pittsburgh	4.675	4.675	4.675	4.50	3.90
Strip, H.R., Pittsburgh	3.75-4.225	3.75-4.225	3.75-4.225	3.75-4.00	2.80
Strip, H.R., Chicago	3.725	3.725	3.725	3.50	2.80
Strip, C.R., Pittsburgh	5.10-5.80	5.10-5.80	5.10-5.80	4.65-5.35	3.55
Strip, C.R., Chicago	5.35	5.35	5.35	4.90	3.65
Strip, C.R., Detroit	5.30-6.05	5.30-6.05	5.30-6.05	4.85-5.60	3.70
Wire, Basic, Pittsburgh	5.10-5.225	5.10-5.225	5.10-5.225	4.85-5.10	3.675
Wire, Wire, Pittsburgh	6.20-6.35	6.20-6.35	6.20-6.35	5.90-6.20	4.625
Tin plate, box, Pittsburgh	$8.95	$8.95	$8.95	$8.70	$5.75

SEMIFINISHED					
Billets, forging, Pitts. (NT)	$70.50	$70.50	$70.50	$66.00	$56.50
Wire rods, ⅜-⅝", Pitts.	4.425	4.425	4.425	4.10-30	3.05

PIG IRON, Gross Ton					
Bessemer, Pitts.	$55.50	$55.50	$55.50	$53.00	$37.00
Basic, Valley	54.50	54.50	54.50	52.00	36.00
Basic, del. Phila.	59.25	59.25	59.25	56.61	38.84
No. 2 Fdry., Pitts.	55.00	55.00	55.00	52.50	36.50
No. 2 Fdry., Chicago	55.00	55.00	55.00	52.50	36.00
No. 2 Fdry., Valley	55.00	55.00	55.00	52.50	36.50
No. 2 Fdry., del. Phila.	59.75	59.75	59.75	57.11	39.34
No. 2 Fdry., Birm.	51.38	51.38	51.38	48.88	34.88
No. 2 Fdry. (Birm. idle), Cin.	58.93	58.93	58.93	55.49	38.74
Malleable, Valley	55.00	55.00	55.00	52.50	36.50
Malleable, Chicago	55.00	55.00	55.00	52.50	36.50
Charcoal, Lyles, Tenn.	68.50	68.50	68.50	66.00	50.00
Ferromanganese, Elto, Pa.	228.00	228.00	228.00	188.00	151.00*

*F.o.b. cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)					
No. 1 Heavy Melt., Pitts.	$44.00	$44.00	$44.00	$44.00	$40.00
No. 1 Heavy Melt., E. Pa.	41.50	41.50	41.50	42.50	42.00
No. 1 Heavy Melt., Chicago	42.50	42.50	42.50	42.50	38.75
No. 1 Heavy Melt., Valley	44.00	44.00	44.00	44.00	39.75
No. 1 Heavy Melt., Cleve.	43.00	43.00	43.00	43.00	39.25
No. 1 Heavy Melt., Buffalo	43.00	43.00	43.00	43.00	42.50
Rails, Rerolling, Chicago	52.50	52.50	52.50	52.50	50.00
No. 1 Cast, Chicago	50.00	50.00	50.00	49.00	55.50

†F.o.b. shipping point.

COKE, Net Ton					
Beehive, Furn., Connlsvl.	$14.75	$14.75	$14.75	$14.75	$12.00-12.50
Beehive, Fdry., Connlsvl.	17.00	17.00	17.00	17.50	14.00-15.00
Oven, Fdry., Chicago	24.50	24.50	23.00	23.00	17.60

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$56.50	$57.00	$57.50	$58.00
NewYork, del.		60.78	61.28	
Newark, del.	59.52	60.02	60.52	61.02
Philadelphia, del.	59.25	59.75	60.25	60.75
Birmingham District				
Alabama City, Ala. R2	50.88	51.38		
Birmingham R2	50.88	51.38		
Birmingham S9		51.38		
Woodward, Ala. W15	50.88	51.38		
Cincinnati, del.		58.93		
Buffalo District				
Buffalo R2	54.50	55.00	55.50	
Buffalo H1	54.50	55.00	55.50	
Tonawanda, N.Y. W12	54.50	55.00	55.50	
No. Tonawanda, N.Y. T9		55.00	55.50	
Boston, del.	65.15	65.65	66.15	
Rochester, N.Y. del.	57.52	58.02	58.52	
Syracuse, N.Y. del.	58.62	59.12	59.62	
Chicago District				
Chicago I-3	54.50	55.00	55.00	55.50
Gary, Ind. U5	54.50		55.00	
Indiana Harbor, Ind. I-2	54.50		55.00	
So. Chicago, Ill. W14	54.50	55.00	55.00	
So. Chicago, Ill. Y1	54.50	55.00	55.00	
So. Chicago, Ill. U5	54.50		55.00	55.50
Milwaukee, del.	56.67	57.17	57.17	57.67
Muskegon, Mich. del.		61.30	61.30	
Cleveland District				
Cleveland A7	54.50	55.00	55.00	55.50
Cleveland R2	54.50	55.00	55.00	
Akron, O. del. from Cleve.	57.11	57.61	57.61	58.11
Lorain, O. N3	54.50			55.50
Duluth I-3			55.00	
Erie, Pa. I-3	54.50	55.00	55.00	55.50
Everett, Mass. E1		59.25	59.75	
Fontana, Calif. K1	60.50	61.00		
Granite City, Ill. G4	56.40	56.90	57.40	
St. Louis, del. (inc. tax)	57.15	57.65	58.15	
Ironton, Utah C11	54.50	55.00		
Geneva, Utah C11	54.50	55.00		
LoneStar, Tex. L6	50.50	*51.00	51.00	
Minnequa, Colo. C10	56.50	57.50	57.50	
Rockwood, Tenn. T3			58.50	
Pittsburgh District				
Neville Island, Pa. P6		55.00	55.00	55.50
Pitts., N.&S. sides, Ambridge				
Aliquippa, del.		56.37	56.37	56.87
McKeesRocks, del.		56.04	56.04	56.54
Lawrenceville, Homestead				
Wilmerding, Monaca, del.		56.66	56.66	57.16
Verona, Trafford, del.		57.19	57.19	57.69
Brackenridge, del.		57.45	57.45	57.95
Hessemer, Pa. U5	54.50		55.00	55.50
Clairton, Rankin, So. Duquesne, Pa. U5	54.50			
McKeesport, Pa. N3	54.50			55.50
Monessen, Pa. P7	56.50			
Sharpsville, Pa. S6			55.00	55.50
Steelton, Pa. B2	56.50	57.00	57.50	58.00
Swedeland, Pa. A3	58.50	59.00	59.50	60.00
Toledo, O. I-3	54.50	55.00	55.00	55.50
Cincinnati, del.	59.97	60.47		
Troy, N.Y. R2	56.50	57.00	57.50	58.00
Youngstown District				
Hubbard, O. Y1	54.50	55.00	55.00	
Youngstown Y1	54.50	55.00	55.00	
Youngstown U5	54.50			55.50
Mansfield, O., del.	59.15	59.65	59.65	60.15

*Low phos, southern grade.

PIG IRON DIFFERENTIAL

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.
Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.
Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.
Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$65.50
Buffalo H1	66.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls, N.Y. P15	$91.00
Keokuk, Iowa, Openhearth & Fdry. frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	93.50
Wenatchee, Wash., OH & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$68.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$59.50
Steelton, Pa. B2	62.50
Philadelphia, delivered	66.05
Troy, N.Y. R2	62.50

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Dec. 11, 1952, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company, key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ....$81.00
Munhall,Pa. U5 .....54.00
Seattle S24 .....75.00

INGOTS, Alloy (NT)
Detroit R7 .....$57.00
Fontana,Calif. K1 ....83.00
Houston S5 .....65.00
Midland,Pa. C18 .....57.00
Munhall,Pa. U5 .....57.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$59.00
Clairton,Pa. U5 .....59.00
Ensley,Ala. T2 .....59.00
Fairfield,Ala. T2 .....59.00
Fontana,Calif. K1 ....78.00
Gary,Ind. U5 .....59.00
Johnstown,Pa. B2 .....59.00
Lackawanna,N.Y. B2 ..59.00
Munhall,Pa. U5 .....59.00
So.Chicago,Ill. U5 .....59.00
So.Duquesne,Pa. U5 ....59.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$70.50
Buffalo R2 .....70.50
Canton,O. R2 .....70.50
Clairton,Pa. U5 .....70.50
Cleveland R2 .....70.50
Conshohocken,Pa. A3 ..77.50
Detroit R7 .....73.50
Ensley,Ala. T2 .....70.50
Fairfield,Ala. T2 .....70.50
Fontana,Calif. K1 ....89.50
Gary,Ind. U5 .....70.50
Geneva,Utah C11 .....70.50
Houston S5 .....78.50
Johnstown,Pa. B2 .....70.50
Lackawanna,N.Y. B2 ..70.50
LosAngeles B3 .....89.50
Munhall,Pa. U5 .....70.50
Seattle B3 .....89.50
So.Chicago R2,U5,W14 70.50
So.Duquesne,Pa. U5 ....70.50
So.SanFrancisco B3 ....89.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$76.00
Buffalo R2 .....76.00
Canton,O. R2 .....76.00
Canton,O. T7 .....78.60
Conshohocken,Pa. A3 ..83.00
Detroit R7 .....79.00
Fontana,Calif. K1 ....95.00
Gary,Ind. U5 .....76.00
Houston S5 .....84.00
Ind.Harbor,Ind. Y1 ....76.00
Johnstown,Pa. B2 .....76.00
Lackawanna,N.Y. B2 ..76.00
LosAngeles B3 .....96.00
Massillon,O. R2 .....76.00
Midland,Pa. C18 .....76.00
Munhall,Pa. U5 .....76.00
So.Chicago R2,U5,W14 76.00
So.Duquesne,Pa. U5 ....76.00
Struthers,O. Y1 .....76.00
Warren,O. C17 .....76.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$87.50
Canton,O. R2 .....87.50
Cleveland R2 .....87.50
Fontana,Calif. K1 ....108.50
Gary,Ind. U5 .....87.50
Massillon,O. R2 .....87.50
So.Chicago,Ill. R2 .....87.50
So.Duquesne,Pa. U5 ....87.50

SHEET BARS (NT)
Fontana,Calif. K1(43) $89.00

SKELP
Aliquippa,Pa. J5 .....$3.65
Munhall,Pa. U5 .....3.55
Warren,O. R2 .....3.55
Youngstown R2, U5 .....3.55

WIRE RODS
Alton,Ill. L1 .....4.70
AlabamaCity,Ala. R2 ....4.325
Buffalo W12 .....4.325
Cleveland A7 .....4.325
Donora,Pa. A7 .....4.325
Fairfield,Ala. T2 .....4.325
Fontana,Calif. K1 .....5.125
Houston S5 .....4.725
Johnstown,Pa. B2 .....4.325
Joliet,Ill. A7 .....4.325
KansasCity,Mo. S5 ....4.665
LosAngeles B3 .....5.125
Minnequa,Colo. C10 ....4.575
Monessen,Pa. P7 .....4.525
No.Tonawanda,N.Y. B11 4.325
Pittsburg,Calif. C11 ....4.975
Portsmouth,O. P12 .....4.525
Roebling,N.J. R5 .....4.425
So.Chicago,Ill. R2 .....4.325
SparrowsPoint,Md. B2 ..4.425
Sterling,Ill.(1), N15 ....4.325
Struthers,O. Y1 .....4.325
Torrance,Calif. C11 .....5.125
Worcester,Mass. A7 .....4.625

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ....4.675
Lackawanna,N.Y. B2 ....4.675
Munhall,Pa. U5 .....4.675
So.Chicago,Ill. U5 .....4.675

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ....3.85
Aliquippa,Pa. J5 .....3.85
Bessemer,Ala. T2 .....3.85
Bethlehem,Pa. B2 .....3.90
Clairton,Pa. U5 .....3.85
Fairfield,Ala. T2 .....3.85
Fontana,Calif. K1 .....4.45
Gary,Ind. U5 .....3.85
Geneva,Utah C11 .....3.85
Houston S5 .....4.25
Ind.Harbor,Ind. I-2 ....3.85
Johnstown,Pa. B2 .....3.90
KansasCity,Mo. S5 .....4.45
Lackawanna,N.Y. B2 ....3.90
LosAngeles B3 .....4.45
Minnequa,Colo. C10 .....4.30
Munhall,Pa. U5 .....3.85
Niles,Calif.(22) P1 .....4.56
Phoenixville,Pa. P4 .....6.10
Seattle B3 .....4.50
So.Chicago,Ill. U5, W14 3.85
So.SanFrancisco B3 .....4.40
Torrance,Calif. C11 .....4.45
Weirton,W.Va. W6 .....4.10

Wide Flange
Bethlehem,Pa. B2 .....3.90
Clairton,Pa. U5 .....3.85
Fontana,Calif. K1 .....4.85
Johnstown,Pa. B2 .....3.90
Lackawanna,N.Y. B2 ....3.90
Munhall,Pa. U5 .....3.85
So.Chicago,Ill. U5 .....3.85

Alloy Stand. Shapes
Clairton,Pa. U5 .....4.725
Fontana,Calif. K1 .....5.925
Gary,Ind. U5 .....4.725
Munhall,Pa. U5 .....4.725
So.Chicago,Ill. U5 .....4.725

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.80
Bessemer,Ala. T2 .....5.80
Bethlehem,Pa. B2 .....5.80
Clairton,Pa. U5 .....5.80
Fairfield,Ala. T2 .....5.80
Fontana,Calif. K1 .....6.40
Gary,Ind. U5 .....5.80
Geneva,Utah C11 .....5.80
Ind.Harbor,Ind. I-2 .....5.80
Ind.Harbor,Ind. Y1 .....6.30
Johnstown,Pa. B2 .....5.80
Lackawanna,N.Y. B2 .....5.80
LosAngeles B3 .....6.35
Munhall,Pa. U5 .....5.80
Seattle B3 .....6.40
So.Chicago,Ill. U5 .....5.80
So.SanFrancisco B3 .....6.30
Struthers,O. Y1 .....5.80

H.S., L.A. Wide Flange
Aliquippa,Pa. J5 .....5.50
Bethlehem,Pa. B2 .....5.80
Lackawanna,N.Y. B2 .....5.80
Munhall,Pa. U5 .....5.75
So.Chicago,Ill. U5 .....5.75

BEARING PILES
Munhall,Pa. U5 .....3.85
So.Chicago,Ill. U5 .....3.85

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.95
Bessemer,Ala. T2 .....5.95
Clairton,Pa. U5 .....5.95
Cleveland J5, R2 .....5.95
Conshohocken,Pa. A3 ....6.20
Ecorse,Mich. G5 .....6.90
Fairfield,Ala. T2 .....5.95
Fontana,Calif.(30) K1 ....6.55
Gary,Ind. U5 .....5.95
Geneva,Utah C11 .....5.95
Ind.Harbor,Ind. I-2 .....5.95
Ind.Harbor,Ind. Y1 .....6.45
Johnstown,Pa. B2 .....5.95
Munhall,Pa. U5 .....5.95
Pittsburgh J5 .....5.95
Seattle B3 .....6.85
Sharon,Pa. S3 .....5.95
So.Chicago,Ill. U5 .....5.95
SparrowsPoint,Md. B2 ....5.95
Warren,O. R2 .....5.95
Youngstown Y1 .....6.45
Youngstown U5 .....5.95

PLATES, Open-Hearth Alloy
Claymont,Del. C22 .....5.35
Coatesville,Pa. I7 .....5.75
Conshohocken,Pa. A3 .....5.55
Fontana,Calif. K1 .....6.20
Gary,Ind. U5 .....5.25
Johnstown,Pa. B2 .....5.25
Munhall,Pa. U5 .....5.25
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 .....5.25
SparrowsPoint,Md. B2 ....5.25

FLOOR PLATES
Cleveland J5 .....4.95
Conshohocken,Pa. A3 ....4.95
Ind.Harbor,Ind. I-2 .....4.95
Munhall,Pa. U5 .....4.95
So.Chicago,Ill. U5 .....4.95

PLATES, Ingot Iron
Ashland,c.l. (15), A10....4.15
Cleveland,c.l. R2 .....4.50
Warren,O.,c.l. R2 .....4.50

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ....3.90
Aliquippa,Pa. J5 .....3.90
Ashland,Ky. (15), A10....3.90
Bessemer,Ala. T2 .....3.90
Clairton,Pa. U5 .....3.90
Claymont,Del. C22 .....4.35
Cleveland J5, R2 .....3.90
Coatesville,Pa. I7 .....4.35
Conshohocken,Pa. A3 ....4.35
Ecorse,Mich. G5 .....4.45
Fairfield,Ala. T2 .....3.90
Fontana,Calif.(30) K1 ....4.50
Gary,Ind. U5 .....3.90
GraniteCity,Ill. G4 .....4.60
Geneva,Utah C11 .....3.90
Harrisburg,Pa. C5 .....6.50
Houston S5 .....4.30
Ind.Harbor,Ind. I-2, Y1 3.90
Johnstown,Pa. B2 .....3.90
Lackawanna,N.Y. B2 ....3.90
Minnequa,Colo. C10 .....4.70
Munhall,Pa. U5 .....3.90
Pittsburgh J5 .....3.90
Seattle B3 .....4.80
Sharon,Pa. S3 .....4.15
So.Chicago,Ill. U5, W14 3.90
SparrowsPoint,Md. B2 ....3.90
Steubenville,O. W10 .....3.90
Warren,O. R2 .....3.90
Weirton,W.Va. W6 .....4.20
Youngstown R2, U5, Y1 3.90

PLATES, Carbon A.R.
Fontana,Calif. K1 .....5.65
Geneva,Utah C11 .....5.05

PLATES, Wrought Iron
(Add 4.7% to base and extras)
Economy,Pa.B14 .....8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ....3.95
Aliquippa,Pa. J5 .....3.95
Alton,Ill. L1 .....4.50
Atlanta,Ga. A11 .....4.50
Bessemer,Ala. T2 .....3.95
Buffalo R2 .....3.95
Canton,O. R2 .....3.95
Clairton,Pa. U5 .....3.95
Cleveland R2 .....3.95
Detroit R7 .....4.10
Ecorse,Mich. G5 .....4.30
Emeryville,Calif. J7 .....4.70
Fairfield,Ala. T2 .....3.95
Fontana,Calif. K1 .....4.65
Gary,Ind. U5 .....3.95
Houston S5 .....4.35
Ind.Harbor,Ind. I-2 Y1 .3.95
Johnstown,Pa. B2 .....3.95
Kansas City,Mo. S5 .....4.55
Lackawanna,N.Y. B2 .....3.95
LosAngeles B3 .....4.65
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 .....4.40
Niles,Calif. P1 .....4.65
N.Tonawanda,N.Y. B11 3.95
Pittsburg,Calif. C11 .....4.65
Pittsburgh J5 .....3.95
Seattle B3, N14 .....4.70
So.Chicago R2,U5,W14 ...3.95
So.Duquesne,Pa. U5 .....3.95
So.SanFran.,Cal. B3 .....4.70
Sterling,Ill. N15 .....4.55
Struthers,O. Y1 .....4.95
Torrance,Calif. C11 .....4.65
Weirton,W.Va. W6 .....4.10
Youngstown R2, U5 .....3.95

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....3.95
Atlanta,A11 .....4.50
Niles,Calif. P1 .....4.65
SanFrancisco S7 .....5.80

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....4.15

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....4.675
Buffalo R2 .....4.675
Canton,O. R2 .....4.675
Canton,O. T7 .....4.72
Clairton,Pa. U5 .....4.675
Detroit R7 .....4.825
Ecorse,Mich. G5 .....5.025
Fontana,Calif. K1 .....5.725
Gary,Ind. U5 .....4.675
Houston S5 .....5.075
Ind.Harbor,Ind. I-2, Y1 4.675
Johnstown,Pa. B2 .....4.675
KansasCity,Mo. S5 .....5.275
Lackawanna,N.Y. B2 .....4.675
LosAngeles B3 .....5.725
Massillon,O. R2 .....4.675
Midland,Pa. C18 .....4.30
So.Chicago R2,U5,W14 ...4.675
So.Duquesne,Pa. U5 .....4.675
Struthers,O. Y1 .....4.675
Warren,O. C17 .....4.675
Youngstown U5 .....4.675

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.925
Gary,Ind. U5 .....4.925
Youngstown U5 .....4.925

BARS & SMALL SHAPES, H. R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.925
Bessemer,Ala. T2 .....5.925
Bethlehem,Pa. B2 .....5.925
Clairton,Pa. U5 .....5.925
Cleveland R2 .....5.925
Ecorse,Mich. G5 .....6.675
Fairfield,Ala. T2 .....5.925
Fontana,Calif. K1 .....6.975
Gary,Ind. U5 .....5.925
Ind.Harbor,Ind. I-2 .....5.925
IndianaHarbor,Ind. Y1 6.425
Johnstown,Pa. B2 .....5.925
Lackawanna,N.Y. B2 .....5.925
LosAngeles B3 .....6.625
Pittsburgh J5 .....5.925
Seattle B3 .....6.675
So.Duquesne,Pa. U5 .....5.925
So.SanFrancisco B3 .....6.675
Struthers,O. Y1 .....6.425
Youngstown U5 .....5.925

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....4.925
BeaverFalls,Pa. R2 ....4.925
BeaverFalls,Pa. M12 ....4.925
Buffalo B5 .....4.975
Camden,N.J. P13 .....5.375
Carnegie,Pa. C12 .....4.925
Chicago B5 .....4.925
Chicago W18 .....4.925
Cleveland A7, C20 .....4.925
Detroit P17, R7 .....5.075
Donora,Pa. A7 .....4.925
Elyria,O. W8 .....4.925
FranklinPark,Ill. N5 ....4.925
Gary,Ind. R2 .....4.925
GreenBay,Wis. F7 .....4.925
Hammond,Ind. I-2, M13 .4.925
Hartford,Conn. R2 .....5.475
LosAngeles R2 .....6.375
Mansfield,Mass. B5 .....5.475
Massillon,O. R2, R8 ....4.925
Monaca,Pa. S17 .....4.925
Newark,N.J. W18 .....5.375
Plymouth,Mich. P5 .....5.175
Pittsburgh J5 .....4.925
Putnam,Conn. W18 .....5.475
Readville,Mass. C14 .....5.475
St.Louis,Mo. M2 .....5.30
So.Chicago,Ill. W14 ....4.925
SpringCity,Pa. K3 .....5.375
Struthers,O. Y1 .....4.925
Waukegan,Ill. A7 .....4.925
Youngstown Y1 .....4.925
Youngstown F3 .....4.925

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .....6.00
BeaverFalls,Pa. M12 ....6.00
Bethlehem,Pa. B2 .....6.00
Buffalo B5 .....6.00
Camden,N.J. P13 .....6.40
Canton,O. R2 .....6.00
Canton,O. T7 .....5.99
Carnegie,Pa. C12 .....6.00
Chicago B5 .....6.00
Chicago W18 .....6.00
Cleveland A7 .....6.05
Cleveland C20 .....6.00
Detroit P17, R7 .....6.15
Donora,Pa. A7 .....6.05
Elyria,O. W8 .....6.00
Gary,Ind. R2 .....6.00
Hammond,Ind. I-2, M13 .6.00
Hartford,Conn. R2 .....6.45
Lackawanna,N.Y. B2 .....6.00
Mansfield,Mass. B5 .....6.45
Massillon,O. R2, R8 ....6.00
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....6.00
Newark,N.J. W18 .....6.35
Plymouth,Mich. P5 .....6.20
So.Chicago,Ill. R2, W14 6.00
SpringCity,Pa. K3 .....6.20
Struthers,O. Y1 .....6.00
Warren,O. C17 .....6.00
Waukegan,Ill. A7 .....6.05
Worcester,Mass. A7 .....6.35
Youngstown Y1 .....6.00
Youngstown F3 .....6.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ....3.95
Atlanta,A11 .....4.50
Buffalo R2 .....3.95
Cleveland R2 .....3.95
Emeryville,Calif. J7 .....4.70
Fairfield,Ala. T2 .....3.95
Fontana,Calif. K1 .....4.65
Gary,Ind. U5 .....3.95
Houston S5 .....4.35
Ind.Harbor,Ind. I-2, Y1 3.95
Johnstown,Pa. B2 .....3.95
KansasCity,Mo. S5 .....4.55
Lackawanna,N.Y. B2 .....3.95
LosAngeles B3 .....4.65
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 .....4.75
Niles,Calif. P1 .....4.65
Pittsburg,Calif. C11 .....4.65
Pittsburgh J5 .....3.95
SandSprings,Okla. S5 .....4.85
Seattle B3, N14 .....4.70
So.Chicago,Ill. R2 .....3.95
So.Duquesne,Pa. U5 .....3.95
So.SanFrancisco B3 .....4.70
SparrowsPoint,Md. B2 ....3.95
Sterling,Ill.(1), N15 .....4.70
Struthers,O. Y1 .....3.95
Torrance,Calif. C11 .....4.65
Youngstown R2, U5 ....3.95

BARS, Reinforcing (Fabricated; to consumers)
Huntington,W.Va. W7 ...5.50
Johnstown, ¼-1" B2 ....5.25
LosAngeles B3 .....5.45
Marion,O. P11 .....5.25
Seattle B3, N14 .....5.50
So.SanFrancisco B3 .....5.45
SparrowsPt. ¼-1" B2 ....5.25
Williamsport,Pa. S19 ....5.35

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ....5.00
ChicagoHts.(3,4) I-2 ....4.75
Franklin,Pa.(3,4) F5 ....5.00
FortWorth,Tex.(26) T4 ..5.10
Huntngt.W.Va.(3) W7 ....5.75
Marion,O.(3) P11 .....4.75
Moline,Ill.(3) R2 .....4.05
Tonawanda(3,4) B12 ....5.00
Williamsport(3) S19 ....5.25
Williamsport(4) S19 ....5.35

BARS, Wrought Iron
(Add 4.7% to base and extras)
Economy,Pa.(8 R.) B14..9.60
Economy,Pa.(D.R.)B14 11.90
Economy(Staybolt)B14 12.20
McK.Rks.(Staybolt)L5.. 14.50
McK.Rks.(8 R.) L5 .....9.60
McK.Rks.(D.R.) L5 ....13.00

SHEETS, Hot-Rolled Steel
(No. gage and heavier)
AlabamaCity,Ala. R2 ....3.775
Ashland,Ky.(8) A10 ....3.775
Butler,Pa. A10 .....3.775
Cleveland J5, R2 .....3.775
Conshohocken,Pa. A3 ....4.175
Detroit M1 .....4.40
Ecorse,Mich. G5 .....3.975
Fairfield,Ala. T2 .....3.775
Fontana,Calif. K1 .....4.725
Gary,Ind. U5 .....3.775
Geneva,Utah C11 .....3.875
GraniteCity,Ill. G4 .....4.30
Ind.Harbor,Ind. I-2, Y1 3.775
Irvin,Pa. U5 .....3.775
Lackawanna,N.Y. B2 .....3.775
Munhall,Pa. U5 .....3.775
Niles,O. N12 .....5.425
Pittsburg,Calif. C11 .....4.675
Pittsburgh J5 .....3.775
Sharon,Pa. S3 .....4.175
So.Chicago,Ill. W14 .....3.775
SparrowsPoint,Md. B2 ....3.775
Steubenville,O. W10 ....3.775
Torrance,Calif. C11 .....4.475
Warren,O. R2 .....3.775
Weirton,W.Va. W6 .....3.775
WestLeechburg,Pa. A4 ....3.925
Youngstown U5, Y1 .....3.775

SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 ....4.925
Dover,O. R1 .....5.825
Mansfield,O. E6 .....5.65
Niles,O. N12 .....5.675
Torrance,Calif. C11 .....5.575

SHEETS, H.R. (14 ga. heavier)
High-Strength Low-Alloy
Cleveland J5, R2 .....5.675
Conshohocken,Pa. A3 ....5.925
Ecorse,Mich. G5 .....6.225
Fairfield,Ala. T2 .....5.675
Fontana,Calif. K1 .....6.625
Gary,Ind. U5 .....5.675
Ind.Harbor,Ind. I-2 .....5.675
Ind.Harbor,Ind. Y1 .....6.175
Irvin,Pa. U5 .....5.675
Lackawanna(35) B2 .....5.675
Munhall U5 .....5.675
Pittsburgh J5 .....5.675
Sharon,Pa. S3 .....5.675
So.Chicago,Ill. U5 .....5.675
SparrowsPoint(36) B2..5.675
Warren,O. R2 .....5.675
Weirton,W.Va. W6 .....6.025
Youngstown U5 .....5.675
Emeryville,Calif. J7 ....4.70
Fairfield,Ala. T2 .....3.95
Fontana,Calif. K1 .....4.65
Gary,Ind. U5 .....3.95
Houston S5 .....4.35
Ind.Harbor,Ind. I-2, Y1 3.95
Johnstown,Pa. B2 .....3.95
KansasCity,Mo. S5 .....4.55
LosAngeles B3 .....4.65
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 .....4.75
Niles,Calif. P1 .....4.65
Pittsburg,Calif. C11 .....4.65
Pittsburgh J5 .....3.95
SandSprings,Okla. S5 .....4.85

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 .....6.925
Ecorse,Mich. G5 .....7.475
Fontana,Calif. K1 .....7.876
Gary,Ind. U5 .....6.925
IndianaHarbor,Ind. Y1 .7.275
IndianaHarbor,Ind. I-2 .6.925
Irvin,Pa. U5 .....6.925
Lackawanna(37) B2 .....6.925
Pittsburgh J5 .....6.925
SparrowsPoint(38) B2..6.925
Warren,O. R2 .....6.925
Weirton,W.Va. W6 .....7.275
Youngstown Y1 .....7.425

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.575
Cleveland Jo. R2	4.575
Ecorse,Mich. G5	4.775
Fairfield,Ala. T2	4.575
Follansbee,W.Va. F4	5.575
Fontana,Calif. K1	5.525
Gary,Ind. U5	4.575
Granite City,Ill. G4	5.275
Ind Harbor,Ind. I-2 Y1	4.575
Irvin,Pa. U5	4.575
Lackawanna,N.Y. B2	4.575
Middletown,O. A10	4.575
Pittsburg,Calif. C11	5.525
Pittsburgh J5	4.575
SparrowsPoint,Md. B2	4.575
Steubenville,O. W10	4.575
Warren,O. R2	4.575
Weirton,W.Va. W6	5.775
Westl eechburg,Pa. A4	5.46
Youngstown Y1	4.575

SHEETS, Galv'd No 10 Steel

Alabama City,Ala. R2	5.075
Ashland,Ky.(8) A10	5.075
Canton,O. R2	5.075
Empire,O. N16	5.675
Dover,O. R1	5.775
Fairfield,Ala. T2	5.075
Gary,Ind. U5	5.075
Granite City,Ill. G4	5.50
Ind Harbor,Ind. I-2	5.075
Irvin,Pa. U5	5.075
Kokomo,Ind.(13) C16	5.475
Martins Ferry,O. W10	5.075
Niles,O. N12	6.275
Pittsburg,Calif. C11	5.825
SparrowsPoint,Md. B2	5.075
Steubenville,O. W10	5.075
Torrance,Calif. C11	5.825
Weirton,W.Va. W6	5.075

SHEETS, Galvanized No 10, High Strength Low-Alloy

Irvin,Pa. U5	7.625
SparrowsPoint(39) B2	7.775

SHEETS, Galvanneal Steel

Canton,O. R2	5.625
Irvin,Pa. U5	5.625
Kokomo,Ind.(13) C16	6.025
Niles,O. N12	6.825

SHEETS, ZINCGRIP Steel No 10

Butler,Pa. A10	5.325
Middletown,O. A10	5.325

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.925
Niles,O. R2 (28)	5.925
Weirton,W.Va. W6	5.775

SHEETS, Well Casing

Fontana,Calif. K1 (43)	5.10
Torrance,Calif. C11	5.275

BLUED Stock, 29 ga

Yorkville,O. W10	7.00
Follansbee,W.Va. F4	7.10
Follansbee (23) F4	6.425

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.925
Cleveland R2	4.925
Gary,Ind. U5	4.925
Granite City,Ill. G4	5.625
Ind Harbor,Ind. I-2	4.925
Irvin,Pa. U5	4.925
Middletown,O. A10	4.925
Youngstown Y1	4.925

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.60
Gary,Ind. U5	6.50
Granite City,Ill. G4	6.70
Ind Harbor,Ind. I-2 Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
Granite City,Ill. G4	6.30
Ind Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.35

SHEETS, Culvert No 16

	Cu Alloy	Cu Fe
Ashland,Ky. A10	5.875	
Canton,O. R2	5.925	6.375
Fairfield,Ala. T2	5.875	6.325
Gary,Ind. U5	5.875	6.325
Ind Harbor,Ind. I-2	5.875	6.325
Irvin,Pa. U5	5.875	6.325
Kokomo,Ind. C16	6.525	
MartinsFy.,O. W10	5.875	
Pittsburg,Cal. C11	6.625	
SparrowsPt.,Md. B2	5.875	
Torrance,Cal. C11	6.625	

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	6.125
Fairfield,Ala. T2	6.125
MartinsFerry,O. W10	6.125

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	4.025
Cleveland R2	4.375
Ind Harbor,Ind. I-2	4.025
Warren,O. R2	4.375

SHEETS, Cold-Rolled Ingot Iron

Butler,Pa. A10	5.075
Cleveland R2	5.175
Middletown,O. A10	5.075
Warren,O. R2	5.175

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.325
Middletown,O. A10	5.575

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.575
Middletown,O. A10	5.575

SHEETS, ALUMINIZED

Butler,Pa. A10	8.425

TINPLATE, American 1.25 Coke (Base Box)

Aliquippa,Pa. J5	$8.70
Fairfield,Ala. T2	8.80
Gary,Ind. U5	8.70
Ind Har. I-2, Y1	8.70
Irvin,Pa. U5	8.70
Pitts. Cal. C11	9.45
Sp.Pt. Md. B2	8.80
Warren,O. R2	8.70
Weirton,W.Va. W6	8.70
Yorkville,O. W10	8.70

TINPLATE, American 1.50 lb

$8.95
9.05
8.95
8.95
9.70
9.05
8.95
8.95
8.95

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
Granite City,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2 Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40		
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

SHEETS, SILICON, H.R. or C.R. (22 Ga.) COILS (Cut lengths 1/2c lower)

	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10 (cut lengths)			7.85	9.10	9.90
Brackenridge,Pa. A4			8.35	9.60	10.40
Granite City,Ill. G4 (cut lengths)			8.55	9.80	
IndianaHarbor,Ind. I-2	7.55	7.85	(34)	(41)	
Mansfield,O. R6 (cut lengths)	7.20	7.35	7.85	9.10	9.90
Niles,O. N12 (cut lengths)	7.95	7.85	7.85		
Vandergrift,Pa. U5		7.85	8.35	9.60	10.40
Warren,O. R2	7.55	7.85	8.35	9.60	10.40
Zanesville,O. A10		7.85	8.35	9.60	10.40

SHEETS, SILICON (22 Ga. Base) COILS (Cut Length 1/2c lower)

Transformer Grade	72	65	58	52
BeechBottom,W.Va. W10 (cut lengths)	10.45	11.00	11.70	12.50
Brackenridge,Pa. A4	10.95			
Vandergrift,Pa. U5	10.95	11.50	12.20	13.00
Warren,O. R2	10.95			
Zanesville,O. A10	10.95	11.50	12.20	13.00

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)			15.35	15.85
Vandergrift,Pa. U5	13.50	14.35	15.35	15.85

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

SHEETS, LT Coated Ternes, 6 lb

Yorkville,O. W10	$8.65

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10	5.475
Gary,Ind. U5	5.475
Mansfield,O. E6	6.05
Middletown,O. A10	5.475
Niles,O. N12	6.275
Weirton,W.Va. W6	5.475

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.575

ROOFING SHORT TERNES (8 lb. Coated)

Gary,Ind. U5	9.75

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.60
Conshohocken,Pa. A3	5.90
Ecorse,Mich. G5	6.30
Fairfield,Ala. T2	5.60
Fontana,Calif. K1	6.55
Gary,Ind. U5	5.65
Ind Harb.,Ind. I-2	5.65
Ind Harbor,Ind. Y1	6.15
Lackawanna,N.Y. B2	5.70
LosAngeles(25) B3	6.40
Seattle(25) B3	6.65
Sharon,Pa. S3	5.65
So.SanFrancisco(25) B3	6.40
SparrowsPoint,Md. B2	5.65
Warren,O. R2	5.65
Weirton,W.Va. W6	6.10
Youngstown Y1	6.15
Youngstown U5	5.65

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5	7.45
Cleveland A7	7.30
Dover,O. G6	8.00
Ecorse,Mich. G5	8.15
Lackawanna,N.Y. B2	7.90
Sharon,Pa. S3	7.30
SparrowsPoint,Md. B2	7.90
Warren,O. R2	7.30
Weirton,W.Va. W6	7.95
Youngstown Y1	7.80

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.725
Alton,Ill. L1	4.225
Ashland,Ky.(8) A10	3.725
Atlanta A11	4.25
Bessemer,Ala. T2	3.725
Bridgeport,Con.(10) S15	4.225
Buffalo(27) R2	3.725
Butler,Pa. A10	3.725
Carnegie,Pa. S18	4.225
Conshohocken,Pa. A3	4.125
Detroit M1	4.40
Ecorse,Mich. G5	4.025
Fairfield,Ala. T2	3.725
Fontana,Calif. K1	4.975
Gary,Ind. U5	3.725
Houston,Tex. S5	4.125
Ind.Harbor,Ind. I-2 Y1	3.725
Johnstown,Pa.(25) B2	3.725
KansasCity,Mo.(9) S5	4.325
Lackawanna,N.Y.(32) B2	3.725
LosAngeles(25) B3	4.475
Milton,Pa. B6	4.35
Minnequa,Colo. C10	4.775
NewBritain(10) S15	4.225
N.Tonawanda,N.Y. B11	3.725
Pittsburg,Calif. C11	4.475
Riverdale,Ill. A7	3.725
SanFrancisco S7	5.09
Seattle(25) B3	4.725
Seattle N14	4.75
Sharon,Pa. S3	4.225
So.Chicago,Ill. W14	3.725
So.SanFrancisco(25) B3	4.475
SparrowsPoint,Md. B2	3.725
Sterling,Ill. N15	4.725
Torrance,Calif. C11	4.475
Warren,O. R2	3.725
Weirton,W.Va. W6	3.825
WestLeechburg,Pa. A4	3.975
Youngstown U5, Y1	3.725

STRIP, Hot-Rolled Alloy

Bridgeprt.Conn.(10) S15	6.05
Carnegie,Pa. S18	6.45
Fontana,Calif. K1	7.30
Gary,Ind. U5	6.10
Houston,Tex. S5	6.50
KansasCity,Mo. S5	6.70
Midland,Pa. C18	5.85
NewBritn.Conn.(10) S15	6.05
Sharon,Pa. S3	6.45
Youngstown U5	6.10

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Bridgeprt.Conn.(10) S15	5.80
Butler,Pa. A10	5.10
Cleveland A7, J5	5.10
Dearborn,Mich. D3	6.05
Detroit I-2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	5.30
Follansbee,W.Va. F4	5.40
Fontana,Calif. K1	6.75
Franklin Park,Ill.(40) T6	5.55
Ind Harbor,Ind. I-2	5.35
Lackawanna,N.Y. B2	5.10
LosAngeles C1	6.85
Mattapan,Mass. T6	5.95
Middletown,O. A10	5.10
NewBritain(10) S15	5.80

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7		7.65	S.25	10.20	12.50
Bridgeport,Conn.(10) S15	5.80	7.65	S.25	10.20	12.50
Bristol,Conn. W1			S.55	10.50	
Carnegie,Pa. S18		7.65	S.25	10.20	12.50
Cleveland A7	5.10	7.30	S.25	10.20	12.50
Dearborn,Mich. D3	6.05	7.90	S.50		
Detroit I-2	6.45	7.50	S.10		
Dover,O. G6	5.70	7.65	S.25	10.20	12.50
Franklin Park,Ill. T6	5.45	7.45	S.40	10.35	12.65
Harrison,N.J. C18			S.55	10.50	12.80
Mattapan,Mass. T6	5.95	7.60	S.55	10.50	12.80
NewBritn.Conn.(10) S15	5.80	7.65	S.25	10.20	12.50
NewCastle,Pa. B4	5.80	7.65	S.25	10.20	
NewCastle,Pa. E5	5.80	7.65	S.25	10.20	12.50
NewHaven,Conn. I-2	6.70	7.60	S.25		
New York W3		7.95	S.55	10.50	12.80
Pawtucket,R.I. N8, Cleve.or Pitts Base		7.65	S.25	10.20	12.50
Worcester,Mass. Base	6.30	7.95	S.55	10.50	12.80
Sharon,Pa. S3	5.80	7.65	S.25	10.20	12.50
Trenton,N.J. R5		7.95	S.55	10.50	12.80
Wallingford,Conn. W2	6.30	7.60	S.25	10.15	12.65
Warren,O. T5	6.20	7.65	S.25	10.20	12.50
Weirton,W.Va. W6	5.80	7.65	S.25	10.20	12.50
Worcester,Mass. A7	5.40	7.60	S.55	10.50	12.80
Worcester,Mass. T6	5.95	7.60	S.55	10.50	12.80
Youngstown C8		7.65	S.25	10.20	12.50

Spring Steel (Tempered)

Trenton,N.J. R5 (29)		10.30	12.50	15.35
Harrison,N.J. C18		10.30	12.50	15.35
NewYork W3		10.30*	12.50*	15.35*
Youngstown C8		10.30	12.50	15.35

* Plus $1.575 per 100 lb.

STRIP, Cold-Rolled Alloy Steel

Bridgeprt.Conn.(10) S15	12.15
Carnegie,Pa. S18	12.00
Cleveland A7	11.40
Dover,O. G6	11.90
Fontana,Calif. K1	13.05
Harrison,N.J. C18	12.00
Midland,Pa. C18	12.00
NewBritn.Conn.(10) S15	12.15
Pawtucket,R.I.(11) N8	12.15
Pawtucket,R.I.(12) N8	12.45
Sharon,Pa. S3	12.00
Worcester,Mass. A7	11.70
Youngstown C8	12.00

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.975
Warren,O. R2	4.325

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.50

TIGHT COOPERAGE HOOP

Atlanta A11	4.45
Riverdale,Ill. A1	4.30
[illegible] P4	4
Youngstown U5	4.15

SHEETS, Galvanized Ingot Iron

Ashland,Ky.(8) A10	5.325
Middletown,O. A10	5.575

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.575
Middletown,O. A10	5.575

SHEETS, ALUMINIZED

Butler,Pa. A10	8.425

TINPLATE, American 1.25 Coke (Base Box)

Aliquippa,Pa. J5	$8.70
Fairfield,Ala. T2	8.80
Gary,Ind. U5	8.70
Ind Har. I-2, Y1	8.70
Irvin,Pa. U5	8.70
Pitts. Cal. C11	9.45
Sp.Pt. Md. B2	8.80
Warren,O. R2	8.70
Weirton,W.Va. W6	8.70
Yorkville,O. W10	8.70

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
Granite City,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2 Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40		
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

SHEETS, SILICON, H.R. or C.R. (22 Ga.) COILS (Cut lengths 1/2c lower)

	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10 (cut lengths)			7.85	9.10	9.90
Brackenridge,Pa. A4			8.35	9.60	10.40
Granite City,Ill. G4 (cut lengths)			8.55	9.80	
IndianaHarbor,Ind. I-2	7.55	7.85	(34)	(41)	
Mansfield,O. R6 (cut lengths)	7.20	7.35	7.85	9.10	9.90
Niles,O. N12 (cut lengths)	7.95	7.85	7.85		
Vandergrift,Pa. U5		7.85	8.35	9.60	10.40
Warren,O. R2	7.55	7.85	8.35	9.60	10.40
Zanesville,O. A10		7.85	8.35	9.60	10.40

SHEETS, SILICON (22 Ga. Base) COILS (Cut Length 1/2c lower)

Transformer Grade	72	65	58	52
BeechBottom,W.Va. W10 (cut lengths)	10.45	11.00	11.70	12.50
Brackenridge,Pa. A4	10.95			
Vandergrift,Pa. U5	10.95	11.50	12.20	13.00
Warren,O. R2	10.95			
Zanesville,O. A10	10.95	11.50	12.20	13.00

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)			15.35	15.85
Vandergrift,Pa. U5	13.50	14.35	15.35	15.85

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

SHEETS, LT Coated Ternes, 6 lb

Yorkville,O. W10	$8.65

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10	5.475
Gary,Ind. U5	5.475
Mansfield,O. E6	6.05
Middletown,O. A10	5.475
Niles,O. N12	6.275
Weirton,W.Va. W6	5.475

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.575

ROOFING SHORT TERNES (8 lb. Coated)

Gary,Ind. U5	9.75

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.60
Conshohocken,Pa. A3	5.90
Ecorse,Mich. G5	6.30
Fairfield,Ala. T2	5.60
Fontana,Calif. K1	6.55
Gary,Ind. U5	5.65
Ind Harb.,Ind. I-2	5.65
Ind Harbor,Ind. Y1	6.15
Lackawanna,N.Y. B2	5.70
LosAngeles(25) B3	6.40
Seattle(25) B3	6.65
Sharon,Pa. S3	5.65
So.SanFrancisco(25) B3	6.40
SparrowsPoint,Md. B2	5.65
Warren,O. R2	5.65
Weirton,W.Va. W6	6.10
Youngstown Y1	6.15
Youngstown U5	5.65

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5	7.45
Cleveland A7	7.30
Dover,O. G6	8.00
Ecorse,Mich. G5	8.15
Lackawanna,N.Y. B2	7.90
Sharon,Pa. S3	7.30
SparrowsPoint,Md. B2	7.90
Warren,O. R2	7.30
Weirton,W.Va. W6	7.95
Youngstown Y1	7.80

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.725
Alton,Ill. L1	4.225
Ashland,Ky.(8) A10	3.725
Atlanta A11	4.25
Bessemer,Ala. T2	3.725
Bridgeport,Con.(10) S15	4.225
Buffalo(27) R2	3.725
Butler,Pa. A10	3.725
Carnegie,Pa. S18	4.225
Conshohocken,Pa. A3	4.125
Detroit M1	4.40
Ecorse,Mich. G5	4.025
Fairfield,Ala. T2	3.725
Fontana,Calif. K1	4.975
Gary,Ind. U5	3.725
Houston,Tex. S5	4.125
Ind.Harbor,Ind. I-2 Y1	3.725
Johnstown,Pa.(25) B2	3.725
KansasCity,Mo.(9) S5	4.325
Lackawanna,N.Y.(32) B2	3.725
LosAngeles(25) B3	4.475
Milton,Pa. B6	4.35
Minnequa,Colo. C10	4.775
NewBritain(10) S15	4.225
N.Tonawanda,N.Y. B11	3.725
Pittsburg,Calif. C11	4.475
Riverdale,Ill. A7	3.725
SanFrancisco S7	5.09
Seattle(25) B3	4.725
Seattle N14	4.75
Sharon,Pa. S3	4.225
So.Chicago,Ill. W14	3.725
So.SanFrancisco(25) B3	4.475
SparrowsPoint,Md. B2	3.725
Sterling,Ill. N15	4.725
Torrance,Calif. C11	4.475
Warren,O. R2	3.725
Weirton,W.Va. W6	3.825
WestLeechburg,Pa. A4	3.975
Youngstown U5, Y1	3.725

STRIP, Hot-Rolled Alloy

Bridgeprt.Conn.(10) S15	6.05
Carnegie,Pa. S18	6.45
Fontana,Calif. K1	7.30
Gary,Ind. U5	6.10
Houston,Tex. S5	6.50
KansasCity,Mo. S5	6.70
Midland,Pa. C18	5.85
NewBritn.Conn.(10) S15	6.05
Sharon,Pa. S3	6.45
Youngstown U5	6.10

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Bridgeprt.Conn.(10) S15	5.80
Butler,Pa. A10	5.10
Cleveland A7, J5	5.10
Dearborn,Mich. D3	6.05
Detroit I-2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	5.30
Follansbee,W.Va. F4	5.40
Fontana,Calif. K1	6.75
Franklin Park,Ill.(40) T6	5.55
Ind Harbor,Ind. I-2	5.35
Lackawanna,N.Y. B2	5.10
LosAngeles C1	6.85
Mattapan,Mass. T6	5.95
Middletown,O. A10	5.10
NewBritain(10) S15	5.80

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7		7.65	S.25	10.20	12.50
Bridgeport,Conn.(10) S15	5.80	7.65	S.25	10.20	12.50
Bristol,Conn. W1			S.55	10.50	
Carnegie,Pa. S18		7.65	S.25	10.20	12.50
Cleveland A7	5.10	7.30	S.25	10.20	12.50
Dearborn,Mich. D3	6.05	7.90	S.50		
Detroit I-2	6.45	7.50	S.10		
Dover,O. G6	5.70	7.65	S.25	10.20	12.50
Franklin Park,Ill. T6	5.45	7.45	S.40	10.35	12.65
Harrison,N.J. C18			S.55	10.50	12.80
Mattapan,Mass. T6	5.95	7.60	S.55	10.50	12.80
NewBritn.Conn.(10) S15	5.80	7.65	S.25	10.20	12.50
NewCastle,Pa. B4	5.80	7.65	S.25	10.20	
NewCastle,Pa. E5	5.80	7.65	S.25	10.20	12.50
NewHaven,Conn. I-2	6.70	7.60	S.25		
New York W3		7.95	S.55	10.50	12.80
Pawtucket,R.I. N8, Cleve.or Pitts Base		7.65	S.25	10.20	12.50
Worcester,Mass. Base	6.30	7.95	S.55	10.50	12.80
Sharon,Pa. S3	5.80	7.65	S.25	10.20	12.50
Trenton,N.J. R5		7.95	S.55	10.50	12.80
Wallingford,Conn. W2	6.30	7.60	S.25	10.15	12.65
Warren,O. T5	6.20	7.65	S.25	10.20	12.50
Weirton,W.Va. W6	5.80	7.65	S.25	10.20	12.50
Worcester,Mass. A7	5.40	7.60	S.55	10.50	12.80
Worcester,Mass. T6	5.95	7.60	S.55	10.50	12.80
Youngstown C8		7.65	S.25	10.20	12.50

Spring Steel (Tempered)

Trenton,N.J. R5 (29)		10.30	12.50	15.35
Harrison,N.J. C18		10.30	12.50	15.35
NewYork W3		10.30*	12.50*	15.35*
Youngstown C8		10.30	12.50	15.35

* Plus $1.575 per 100 lb.

STRIP, Cold-Rolled Alloy Steel

Bridgeprt.Conn.(10) S15	12.15
Carnegie,Pa. S18	12.00
Cleveland A7	11.40
Dover,O. G6	11.90
Fontana,Calif. K1	13.05
Harrison,N.J. C18	12.00
Midland,Pa. C18	12.00
NewBritn.Conn.(10) S15	12.15
Pawtucket,R.I.(11) N8	12.15
Pawtucket,R.I.(12) N8	12.45
Sharon,Pa. S3	12.00
Worcester,Mass. A7	11.70
Youngstown C8	12.00

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.975
Warren,O. R2	4.325

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.50

TIGHT COOPERAGE HOOP

Atlanta A11	4.45
Riverdale,Ill. A1	4.30
[illegible] P4	4
Youngstown U5	4.15

SHEETS, Galvanized Ingot Iron

Ashland,Ky.(8) A10	5.325
Middletown,O. A10	5.575

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.575
Middletown,O. A10	5.575

SHEETS, ALUMINIZED

Butler,Pa. A10	8.425

TINPLATE, American 1.25 Coke (Base Box)

Aliquippa,Pa. J5	$8.70
Fairfield,Ala. T2	8.80
Gary,Ind. U5	8.70
Ind Har. I-2, Y1	8.70
Irvin,Pa. U5	8.70
Pitts. Cal. C11	9.45
Sp.Pt. Md. B2	8.80
Warren,O. R2	8.70
Weirton,W.Va. W6	8.70
Yorkville,O. W10	8.70

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WIRE, Merchant Quality

(6 to 8 gage)	An'ld.	Galv.
AlabamaCity R2	6.075	6.325
Aliquippa J5	6.075	6.525‡
Atlanta A11	6.325	6.675
Bartonville(19)K4	6.075	6.40
Buffalo W12	7.225	
Cleveland A7	6.075	6.225
CrawfordsvilleMS	6.175	6.55
Donora,Pa. A7	6.075	6.225
Duluth,Minn. A7	6.075	6.225
Fairfield T2	6.075	6.225
Houston,Tex. S5	6.4½	6.625
Johnstown B2	6.075	6.45†
Joliet,Ill. A7	6.075	6.225
KansasCy,Mo. S5	6.675	6.825
Kokomo C16	6.175	6.425
LosAngeles B3	7.025	
Minnequa C10	6.325	6.70*
Monessen P7	6.075	6.45
Palmer W12	5.525	
Pitts.,Calif. C11	7.025	7.175
Prtsmth(19)P12	6.475	
Rankin A7	6.075	6.225
So.Chicago R2	6.075	6.325
So.S.Fran. C10	7.025	7.40*
SparrowsPt. B2	6.175	6.55†
Sterling,Ill.(1)N15	6.075	6.40
Struthers,O. Y1	6.075	6.475
Torrance,Cal. C11	7.025	
Worcester A7	6.375	6.525

* Based on 14c zinc; † 14.50c zinc; ‡ 17.5c zinc.

ROPE WIRE

Alton,Ill. L1	9.15
Bartonville,Ill. K4	8.95
Buffalo W12 (43)	8.55
Fostoria,O. S1 (43)	8.85
Johnstown,Pa. B2 (43)	8.85
Monessen,Pa. P16 (43)	8.55
Monessen,Pa. P7 (43)	8.80
Muncie,Ind. I-7 (43)	8.75
Palmer,Mass. W12 (43)	8.85
Portsmouth,O. P12 (43)	8.55
Roebling,N.J. R5 (43)	8.85
SparrowsPt. B2 (43)	8.65
Struthers,O. Y1 (43)	8.55
Worcester J4, T6 (43)	8.85

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.225
Aliquippa,Pa. J5 (42)	4.75
Atlanta A11	5.475
Alton,Ill. L1	5.45
Bartonville,Ill. K4	5.325
Buffalo W12	5.225
Chicago W13	5.475
Cleland A7, C20	5.225
Crawfordsville,Ind. MS	5.325
Donora,Pa. A7	5.225
Duluth,Minn. A7	5.225
Fairfield,Ala. T2	5.225
Fostoria,O. (24) S1	5.725
Houston S5	5.625
Johnstown,Pa. B2	5.225
Joliet,Ill. A7	5.225
KansasCity,Mo. S5	5.825
Kokomo,Ind. C16	5.325
LosAngeles B3	6.175
Minnequa,Colo. C10	5.475
Monessen,Pa. P7	5.475
Newark 6-8 ga. I-1	5.88
No.Tonawanda B11	5.225
Palmer,Mass. W12	5.525
Pittsburg,Calif. C11	6.175
Portsmouth,O. P12	5.625
Rankin,Pa. A7	5.225
So.Chicago,Ill. R2	5.225
So.SanFrancisco C10	6.175
SparrowsPoint,Md. B2	5.325
Sterling,Ill. (1) N15	5.225
Struthers,O. Y1	5.225
Torrance,Calif. C11	7.025
Waukegan,Ill. A7	5.225
Worcester,Mass. A7	5.525

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	6.20
Buffalo W12 (43)	6.35
Cleveland A7 (43)	5.85
Crawfordsville,Ind. MS(43)	5.85
Donora,Pa. A7 (43)	6.20
Fostoria,O. S1 (43)	6.00
Kokomo,Ind. C16 (43)	5.70
FranklinPark,Ill. T6(43)	6.20
Massillon,O. R8 (43)	5.85
Monessen,Pa. P16 (43)	6.35
Monessen,Pa. P7 (43)	6.10
Pawtkt,R.I.(12) N8 (43)	6.85
Trenton,N.J. R5 (43)	6.15
Worcester,Mass. A7 (43)	6.15
Worcester,Mass. T6 (43)	6.50
Worcester,Mass W12(43)	6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.90
Monessen,Pa. P16 (43)	8.50
Muncie,Ind. I-7 (43)	8.70
Roebling,N.J. R5 (43)	8.80
SparrowsPt.,Md. B2(43)	8.60
Johnstown,Pa. B2 (43)	8.50

WIRE 116 gage	Anl'd. Stone	Galv. Stone
(Add 4.7% on base and extras)		
Aliquippa J5	10.15	12.15
Bartonville(19)K4	10.25	12.00*
Cleveland A7	10.25	11.55
Crawfrdsville MS	10.25	12.00
Fostoria,O. S1	10.40	13.00
Johnstown,Pa. B2	10.73	12.58‡
Kokomo C16	10.625†	12.325†
Minnequa C10	10.40	12.425*
Palmer,Mass W12	10.25	12.15
Pitts.,Cal. C11	10.60	11.90
SparrowsPt. B2	10.84	12.68‡
Waukegan,Ill. A7	10.25	11.55
Worcester A7	11.85	

* Based on 14c zinc; § 14.50c zinc. † Includes 4.7% increase.

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 (43)	6.25
Alton,Ill. L1	6.85
Bartonville,Ill. K4	6.64
Buffalo W12 (43)	6.25
Cleveland A7 (43)	6.25
Donora,Pa. A7 (43)	6.25
Duluth,Minn. A7 (43)	6.25
Fostoria,O. S1 (43)	6.25
Johnstown,Pa. B2 (43)	6.25
Kokomo,Ind. C16 (43)	6.05
Minnequa,Colo. C10 (43)	6.50
Monessen,Pa. P7 (43)	6.25
Monessen,Pa. P16	6.75
Muncie,Ind. I-7 (43)	6.45
Palmer,Mass. W12 (43)	6.55
Pittsburg,Calif. C11 (43)	7.20
Roebling,N.J. R5 (43)	6.55
Portsmouth,O. P12(43)	6.25
So.Chicago,Ill. R2 (43)	6.25
So.SanFran. C10 (43)	7.20
SparrowsPt.,Md. B2 (43)	6.35
Struthers,O. Y1 (43)	6.25
Trenton,N.J. A7 (43)	6.55
Waukegan,Ill. A7 (43)	6.25
Worcester A7, T6 (43)	6.55
Worcester,Mass. W12(43)	6.55
Worcester,Mass. J4 (43)	6.75

WIRE, Tire Bead

Bartonville,Ill. K4	11.51
Monessen,Pa. P16 (43)	11.40
Roebling,N.J. R5 (43)	11.55

WIRE, Fine & Weaving (8"Coils)

Bartonville,Ill. K4	9.42
Buffalo W12 (43)	8.90
Chicago W13	9.32
Cleveland A7 (43)	8.90
Crawfordsville,Ind. MS(43)	8.90
Fostoria,O. S1 (43)	8.90
Johnstown,Pa. B2 (43)	8.90
Kokomo,Ind. C16 (43)	8.90
Monessen,Pa. P16 (43)	8.90
Muncie,Ind. I-7 (43)	9.10
Palmer,Mass. W12 (43)	9.20
Roebling,N.J. R5 (43)	9.20
Waukegan,Ill. A7 (43)	8.90
Worcstr,Mass. A7,T6(43)	9.20

WIRE, Barbed	Col.
AlabamaCity,Ala. R2	144
Aliquippa,Pa. J5	148‡
Atlanta A11	149
Bartonville,Ill.(19) K4	146
Crawfordsville,Ind. MS	149
Donora,Pa. A7	142
Duluth,Minn. A7	142
Fairfield,Ala. T2	142
Houston,Tex. S5	150
Johnstown,Pa. B2	147
Joliet,Ill. A7	142
KansasCity,Mo. S5	154
Kokomo,Ind. C16	149
Minnequa,Colo. C10	153*
Monessen,Pa. P7	147
Pittsburg,Calif. C11	162
Rankin,Pa. A7	142
So.Chicago,Ill. R2	144
So.SanFran.,Calif. C10	167*
SparrowsPoint,Md. B2	149
Sterling,Ill.(1) N15	146

*Based on 14c zinc; 117½c zinc.

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.275
Alton,Ill. L1	6.50
Buffalo W12	6.275
Cleveland A7	6.275
Donora,Pa. A7	6.275
Duluth,Minn. A7	6.275
Johnstown,Pa. B2	6.275
LosAngeles B3	7.225
Minnequa,Colo. C10	6.525
Monessen,Pa. P7	6.275
Monessen,Pa. P16(42)	6.40
NewHaven,Conn. A7	6.575
Palmer,Mass. W12	6.575
Pittsburg,Calif. C11	7.225
Portsmouth,O. P12	6.275
Roebling,N.J. R5	6.575
So.Chicago,Ill. R2	6.275
So.SanFrancisco C10	7.225
SparrowsPoint,Md. B2	6.375
Torrance,Calif. C11	7.225
Trenton,N.J. A7	6.575
Waukegan,Ill. A7	6.275
Worcester,Mass. A7	6.975

WOVEN FENCE,9-15½ Ga.	Col.
AlabamaCity,Ala. R2	135
Ala.City,Ala.,17-18ga.R2	222
Aliquippa,Pa.9-14½ga.J5	139‡
Atlanta A11	140
Bartonville,Ill.(19) K4	137
Crawfordsville,Ind. MS	140
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Houston,Tex. S5	141
Johnstown,Pa. B2	138
Johnstown,17ga.,6" B2	229
Joliet,Ill. A7	133
KansasCity,Mo. S5	145
Kokomo,Ind. C16	140
Minnequa,Colo. C10	146*
Monessen,Pa. P7	138
Pittsburg,Calif. C11	156
Rankin,Pa. A7	133
So.Chicago,Ill. R2	135
Sterling,Ill.(1) N15	137

*Based on 14c zinc; 117½c zinc.

BALE TIES, Single Loop — Col.

AlabamaCity,Ala. R2	132
Atlanta A11	135
Bartonville,Ill.(19) K4	132
Crawfordsville,Ind. MS	134
Donora,Pa. A7	132
Duluth,Minn. A7	132
Fairfield,Ala. T2	132
Joliet,Ill. A7	132
KansasCity,Mo. S5	134
Kokomo,Ind. C16	134
Minnequa,Colo. C10	137
Pittsburg,Calif. C11	156
So.Chicago,Ill. R2	132
So.SanFran.,Calif. C10	156
SparrowsPoint,Md. B2	134
Sterling,Ill.(1) N15	132

FENCE POSTS

ChicagoHts.,Ill. C2	145
Duluth,Minn. A7	133
Franklin,Pa. F5	145
Huntington,W.Va. W7	148
Johnstown,Pa. B2	148
Marion,O. P11	140
Minnequa,Colo. C10	138
Moline,Ill. R2	136
So.Chicago,Ill. R2	140
Tonawanda,N.Y. B12	148
Williamsport,Pa. S19	158

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.85
Lebanon,Pa. (31) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh O3, P14	9.85

AXLES

Ind.Harbor,Ind. S13	5.65
Johnstown,Pa. B2	5.65

NAILS, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	127
Aliquippa,Pa. J5 (44)	118
Atlanta A11	130
Bartonville,Ill.(19) K4	127
Chicago,Ill. W13	127
Cleveland A9 (44)	125
Crawfordsville,Ind. MS	130
Donora,Pa. A7	127
Duluth,Minn. A7	127
Fairfield,Ala. T2	127
Galveston,Tex. D7	135‡
Houston,Tex. S5 (44)	126
Johnstown,Pa. B2	127
Joliet,Ill. A7	127
KansasCity,Mo. S5 (44)	130
Kokomo,Ind. C16	129
Minnequa,Colo. C10 (44)	123
Monessen,Pa. P7	127
Pittsburg,Calif. C11	146
Portsmouth,O. P12	132
Rankin,Pa. A7	127
So.Chicago,Ill. R2	127
SparrowsPt.,Md. B2	129
Sterling,Ill.(1) N15	127
Torrance,Calif. C11	147
Worcester,Mass. A7	133

STAPLES, Polished, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	126
Aliquippa,Pa. J5	126
Atlanta A11	129
Bartonville,Ill. (19) K4	126
Chicago W13	127
Crawfordsville,Ind. MS	128
Donora,Pa. A7	126
Duluth,Minn. A7	126
Fairfield,Ala. T2	126
Johnstown,Pa. B2	126
Joliet,Ill. A7	126
Kokomo,Ind. C16	128
Minnequa,Colo. C10 (45)	123
Monessen,Pa. P7	127
Pittsburg,Calif. C11	145
Portsmouth,O. P12	132
Rankin,Pa. A7	126
So.Chicago,Ill. R2	126
SparrowsPt.,Md. B2	128
Torrance,Calif. C11	146
Worcester,Mass. A7	132

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$7.80
Wheeling,W.Va. W10	7.80

TIE PLATES

Fairfield,Ala. T2	4.775
Gary,Ind. U5	4.775
Ind.Harbor,Ind. I-2	4.775
Lackawanna,N.Y. B2	4.775
Minnequa,Colo. C10	$95.50*
Pittsburg,Calif. C11	4.925
Seattle B3	4.925
Steelton,Pa. B2	4.775
Torrance,Calif. C11	4.925

* Per net ton.

JOINT BARS

Bessemer,Pa. U5	4.925
Fairfield,Ala. T2	4.925
Ind.Harbor,Ind. I-2	4.925
Lackawanna,N.Y. B2	4.925
Minnequa,Colo. C10	4.925
Steelton,Pa. B2	4.925

STANDARD TRACK SPIKES

	Std. No. 1	Std. No. 2	Std. Rnd. All No. 2	60 lb Under
RAILS				
Bessemer,Pa. U5	3.775	3.675	3.725	4.25
Ensley,Ala. T2	3.775	3.675		4.25
Fairfield,Ala. T2				4.25
Gary,Ind. U5	3.775	3.675	3.725	
Huntington,W.Va. W7				5.25
Indiana Harbor,Ind. I-2	3.775	3.675	3.725	
Johnstown,Pa. B2			(16)‡	4.25
Lackawanna,N.Y. B2	3.775	3.675		4.25
Minnequa,Colo. C10	$75.50*	$73.50*		4.75
Steelton,Pa. B2	3.775	3.675		
Williamsport,Pa. S19				5.00

* Per net ton.

TOOL STEEL

(Prices subject to 4.7% increase)

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.350
Hi-Carbon-Cr	0.635

Grade by Analysis

W	Cr	V	Co	
18	4	1	....	1.505
18	4	2		1.65-1.66
20	25	4	25 1.6 12	25 3.535-3.675
19	4	2	7	2.460
18	25	4	25 1 4	75 2.125
18	4	2	9	2.445-2.45
13	5	4	2	1.6025
9	3	25	0 5	1.01

W	Cr	V	Mo	
6	4	1.5	5	0.96-0.965
6	4	3	6	1.190
1.5	4	1	8.5	0.810

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(6) Chicago or Birm. base.
(7) To jobbers, 2 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(15) ¼" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven Conn., base
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.85c.
(27) Bar mill sizes.
(28) Rondelized.
(29) Add $31.50 per ton.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 7.85c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9-10c for cut lengths.
(42) Plus 0.375c per 100 lb.
(43) Plus 4.7% on base and extras.
(44) Plus 45c per 100 lb.
(45) Plus 40c per 100 lb.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
N2 National Supply Co.
N3 National Tube Div.
N5, Nelsen Steel & Wire Co.
N8 NewEng-HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P8 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Div.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S24 Seidelhuber Steel
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
U4 Universal Cyclops Steel
U5 United States Steel Co.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet & Tube

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L. L. COLBERT
President, Chrysler Corporation

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STEEL
The Weekly Magazine of Metalworking

BUTTWELD STANDARD PIPE, T & C Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼		1½		2		2½		3	
List Per Ft	8.5c		11.5c		17c		23c		27.5c		37c		58.5c		76.5c	
Pounds Per Ft	0.85		1.13		1.68		2.28		2.73		3.68		5.82		7.62	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	32.5	15.25	35.5	18.25	38	20.75	38.5	20.5	39	21	39.5	21.5	40	21.25	40	21.25
Alton, Ill. L1	29.5	10.5	32.5	14.5	35	18	35.5	18.5	36	19.5	36.5	20	37	20.5	37	20.5
Benwood, W. Va. W10	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	21.5	39.5	22	40	21.75	40	21.75
Etna, Pa. N2 (†)	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	22.25	39.5	22	40	21.75	40	21.75
Fontana, Calif. K1 (†)	21	1.75	24	5.75	26.5	9.25	27	9	27.5	10	28	10.5	28.5	10.25	28.5	10.25
Ind. Harbor, Ind. Y1 (†)	31.5	14.25	34.5	18.25	37	21.75	37.5	21	38	22	38.5	22.25	39	21.75	39	21.75
Lorain, O. N3 (*)	32.5	22.25	35.5	26.25	38	29.75	38.5	27.25	39	28.25	39.5	28.75	40	26.25	40	26.25
Sharon, Pa. M6	32.5	14.25	35.5	18.25	38	21.25	38.5	20.50	39	21.00	39.5	21.50	40	20.75	40	20.75
Sparrows Pt., Md. B2	30.5	11.25	33.5	15.25	36	18.75	36.5	18.5	37	19.5	37.5	20	38	19.75	38	19.75
Youngstown R2 (‡)	32.5	15.25	35.5	19.25	38	22.75	38.5	22.00	39	23.00	39.5	23.50	40	22.75	40	22.75
Youngstown Y1 (‡)	32.5	15.25	35.5	19.25	38	22.75	38.5	22.00	39	23.00	39.5	23.50	40	22.75	40	22.75
Wheatland, Pa. W9	32.5	13.25	35.5	16.25	38	18.75	38.5	19	39	19.5	39.5	20	40	20.25	40	20.25

SEAMLESS STANDARD PIPE, T & C Carload discounts from list, %

Size-Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5(‡)	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Ambridge, Pa. N2	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Lorain, O. N3 (*)	24	12.75	27	12.75	27	12.75	29	14.75	20	14.75	33.75	19.5	33.75	19.5
Youngstown Y1 (‡)	24	7.50	27	9.25	27	9.25	29	11.25	29	11.25	33.75	16	33.75	16

ELECTRIC WELD STANDARD PIPE, T & C

Youngstown, R2 (‡)	24	7.50	27	9.25	27	9.25	29	11.25	29	11.25	33.75	16	33.75	16

BUTTWELD STANDARD PIPE, T & C Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼		1½		2		2½		3		4	
List Per Ft	5.5c		6c		6c		92c		$1.09	
Pounds Per Ft	0.24		0.42		0.57		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Benwood, W. Va. W10	29.5	+0.25	23.25	+3.5	17.75	+7.75	33	14.25	33	14.25	33	14.25	..	..	..	..	..	..	..	..	..	..	..	..
Butler, Pa. F6 (†)	30.5	1.25	25	+1.75	20	+5.5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Etna, Pa. N2 (†)	30.5	+0.25	23	+1.75	20	+5.5	33	14.25	33	14.25	33	14.25	..	..	..	..	..	..	..	..	..	..	..	..
Sharon, Pa. M6 (‡)	29.5	+0.25	23	+4.25	18	+8.25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Sparrows Pt., Md. B2	28.5	+0.75	23	+3.75	18	+7.50	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Youngstown R2 (‡)	..	..	..	..	..	..	33	15.25	33	15.25	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Wheatland, Pa. W9	28.5	+0.75	23	+3.75	18	+7.50	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 12.50c; (‡), 14.50c; (*), 5c, with discounts adjusted depending on price of zinc at time of shipment.

CLAD STEELS

(Cents per pound; add 4.7% to base price and extras)

Cladding	Plates		Sheets		
	Carbon Base		Carbon Base		Copper Base
Stainless	10%	20%	10%	20%	Both Sides
302	....	....	19.75	26.24-27.50	77.00
304	25.00	29.50	24.50	27.50-27.77	77.00
309	30.50	35.00	....	....	....
310	36.50	41.00	....	....	*144.00
316	29.50	34.00	26.00	35.92-36.50	....
317	34.50	39.00	....	....	....
318	33.50	38.00	....	....	....
321	26.50	31.00-32.00	23.00	33.00	111.00
347	27.50	32.00	24.00	33.50-33.83	130.00
405	21.25	27.75	....	....	....
410	20.75	27.25	....	....	....
Nickel	33.55	45.15	....	....	165.00
Inconel	41.23	54.18	....	....	....
Monel	34.93	46.28	....	....	....
Copper*	....	....	....	44.00	....

	Strip			
	Carbon Base			
	Cold-Rolled		Hot-Rolled	
	10%	Both Sides	10%	Both Sides
Nickel	41.00	54.00	....	....
Copper*	23.70	26.65	20.20	26.40

* Deoxidized. Production points for carbon base products: Stainless plates, sheets, Conshohocken, Pa. A3 and New Castle, Ind. I4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa. S18; Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:

½-in. & smaller diam.	15
⅝-in. & ⅝-in.	18.5
¾-in. and larger	17.5
Longer than 6 in.:	
All diams	14
Lag bolts, all diams.	
6 in. and shorter	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap and Sleigh Shoe	21
Tire Bolts	21
Boiler & Fitting-Up Bolts	31

NUTS

H.P. & C.P. Square:	Reg.	Hvy.
½-in. & smaller	15	15
⅝-in. & ⅝-in.	12	6.5
¾-in.-1 1/4-in.	9	1
1⅜-in. & larger	7.5	1
H.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅝-in.	16.5	6.5
¾-in.-1½-in.	12	2
1⅝-in. & larger	8.5	2
C.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅝-in.	23	17.5
¾-in. & 1 1/4-in.	19.5	12
1⅜-in. & larger	12	6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.	Light
½-in. & smaller	35	28.5	35
⅝-in. & ⅝-in.	29.5	22	28.5
¾-in.-1½-in.	24	15	28
1⅝-in. & larger	13	8.5	28

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	35
¼-in. diam. & larger	16
N.F. thread, all diams.	10

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	48 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
⅝-in. & smaller	42
⅝-in. through 1 in.	34
Longer than 6 in.:	
⅝-in. & smaller	26
⅝-in. through 1 in.	4

METALLURGICAL COKE

Price net ton

BEEHIVE OVENS

Connellsvll.fur.	$14.50-15.00
Connellsvll.fdy.	16.50-17.50
New River foundry	20.80
Wise county, foundry	15.95
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J. ovens	$24.00
Everett, Mass., ovens	
New England, del.	*26.05
Chicago ovens	24.50
Chicago, del.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, del.	28.12
Cincinnati, del.	25.85
Ironton, O., ovens	22.50
Cincinnati, del.	25.12
Painesville, O., ovens	25.50
Cleveland, del.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	20.30
Cincinnati, del.	25.23
LoneStar,Tex., ovens	18.50
Philadelphia, ovens	23.95
Neville Island,Pa.,ovens	23.00
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis, del.	25.40
Portsmouth, O., ovens	22.50
Cincinnati, del.	25.12
Detroit, ovens	25.50
Detroit, del.	26.50
Buffalo, del.	28.08
Flint, del.	28.23
Pontiac, del.	27.06
Saginaw, del.	28.58

*Or within $4.55 freight zone from works.

NOTE: Current prices on boiler tubes, coal chemicals, fluorspar, electrodes and rivets appeared on page 169, Dec. 8 issue.

STAINLESS STEEL

(Add 4.7% on base price and extras)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.25	36.75	31.50
303	43.25	40.25	34.00
304	43.25	38.75	33.00
309	56.00	55.00	44.75
316	57.00	59.00	49.25
321	49.25	48.25	37.00
347	53.75	52.25	41.50
410	36.50	30.50	25.75
416	37.00	37.00	26.25
420	44.00	47.00	31.25
430	39.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00	15.25

Balt., Types 301-347 and 430 sheets, except 303 and 309 E2.

Brackenridge, Pa. sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa. sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301; 36.50c, 302, 38.50c, 304; 58.50c, 316, 52.00c, 347; 30.50c, 410; 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316; 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Muncie, Ind., wire I-7 quotes types 302, 304, 430.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars U4.

Wallingford, Conn., strip W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip except Types 303, 309, 316, 416, 501 and 502 and 34.25c on Type 301 C8.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron: 98+% Fe, annealed	18.00
Unannealed	14.50
Swedish, c.l.f. New York, in bags	8.85-9.95
Electrolytic iron:	
Annealed, 99.5% Fe	42.50
Unannealed (99 + % Fe)	36.50
Unannealed, 99 + % Fe (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	33.00
Antimony, 500 lb lots	71.00
Brass, 20-ton lots	28.25-32.00
Bronze, 10-ton lots	51.25-60.00
Phosphor-Copper, 20-ton lots	50.00
Copper:	
Electrolytic Reduced	37.25 34.75
Lead	22.50
Magnesium	75.00-85.00
Manganese:	
Minus 100 mesh	57.00
Minus 35 mesh	32.00
Minus 200 mesh	62.00
Nickel unannealed	86.00
Nickel-Silver 5-ton lots	44.50
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainless Steel, 302	83.00
Zinc, 10-ton lots	20.00-28.00
Tungsten	Dollars
Melting grade, 99% 50 to 200 mesh:	
1000 lb and over	5.85
Less than 1000 lb	6.00
Molybdenum: 99.9%, minus 200 mesh	3.24
Chromium, electrolytic 99% Cr min.	3.50

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WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound for delivery within switching limits, subject to extras.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140††		Carbon	Floor
New York (city)	6.56	7.57	8.72	6.56	...	6.89	7.53‡	11.34	6.69	6.90	8.31
JerseyCity(c'try)	6.35	7.27	8.47	6.75	...	6.59	7.53	9.54	6.39	6.60	8.01
Boston (city)	6.71	7.56	8.74	6.75	...	6.62	7.69‡	11.38	6.76	6.95	8.18
Boston (c'try)	6.51	7.36	8.54	6.55	...	6.42	7.49‡	11.18	6.56	6.75	7.98
Phila. (city)	6.36	7.38	8.55	6.70	8.55	6.67	7.70‡	11.04	6.42	6.49	7.62
Phila. (c'try)	6.11	7.13	8.30	6.45	8.30	6.42	7.45‡	10.79	6.17	6.24	7.36
Balt. (city)	6.01	7.37	8.57	6.62	...	6.61	7.62‡	11.37	6.67	6.67	7.90
Balt. (c'try)	5.81	7.17	8.37	6.42	...	6.41	7.42‡	11.17	6.47	6.47	7.70
Norfolk, Va.	7.60	...	...	...	...	6.44	8.45	...	7.25	6.64	7.33
Richmond, Va.	6.14	6.95	8.68	6.53	...	6.30	7.38	...	6.58	6.68	7.80
Wash. (w'hse)	6.31	7.61	8.90	6.89	...	6.90	7.78	...	6.93	6.95	8.17
Buffalo (del.)	6.00	6.85	8.61	6.41	...	6.10	7.15‡	11.27	6.28	6.50	7.87
Buffalo (w'hse)	5.80	6.65	8.41	6.21	...	5.90	6.95‡	11.07	6.08	6.30	7.67
Pitts. (w'hse)	5.80	6.65	8.00	5.94	...	5.83	6.90‡	10.65	5.95	5.95	7.18
Detroit (w'hse)	6.07	6.92	8.64	6.13	7.70-8.03	6.12	7.10‡	10.92	6.42	6.47	7.52
Cleveland (del.)	6.00	6.85	8.34	6.20	...	6.09	7.10‡	10.99	6.48	6.32	7.71
Cleve. (w'hse)	5.80	6.65	8.14	6.00	...	5.89	6.90‡	10.79	6.28	6.12	7.51
Cincin. (city)	6.28	6.87	8.62	6.29	...	6.28	7.31‡	11.22	6.57	6.62	7.75
Chicago (city)	6.00	6.85	8.20	6.03	...	6.03	7.00‡	10.85	6.15	6.15	7.38
Chicago (w'hse)	5.80	6.65	8.00	5.83	...	5.83	6.80‡	10.65	5.95	5.95	7.18
Milwau. (city)	6.17	7.02	8.37	6.20	...	6.20	7.27‡	11.02	6.32	6.32	7.55
Milwau. (c'try)	5.97	6.82	8.17	6.00	...	6.00	7.07‡	10.82	6.12	6.12	7.35
St. Louis (del.)	6.30	7.14	8.50	6.34	...	6.33	7.40‡	11.15	6.55	6.55	7.78
St. L. (w'hse)	6.10	6.94	8.00	6.14	...	6.13	7.20‡	10.95	6.35	6.35	7.58
Birm'hm (city)	5.95	6.80	7.85[2]	5.95	...	5.95	8.40	...	6.10	6.25	8.65
Birm'hm(w'hse)	5.80	6.65	7.70[2]	5.80	...	5.80	8.40	...	5.95	6.10	8.65
Los Ang. (city)	6.80	8.65	9.80	6.95	11.40	6.80	8.80‡	12.25	6.80	6.85	9.10
L. A. (w'hse)	6.60	8.45	9.60	6.75	11.20	6.60	8.60‡	12.05	6.60	6.65	8.90
Seattle-Tacoma	7.37	9.17	9.85	7.14	...	7.14	9.62‡	10.90§	6.89	7.20	9.11
S. Fran.(w'hse)	6.90	8.20	9.60	6.75	...	6.65	8.65‡	12.05	6.50	6.70	8.90

*Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes 25-cent special bar quality extra; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2]—500 to 1499 lb; [3]—450 to 1499 lb; [4]—1000 to 1999 lb.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

Old range bessemer	$9.45
Old range nonbessemer	9.30
Mesabi bessemer	9.20
Mesabi nonbessemer	9.05
High phosphorus	9.05

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 1, 1950, in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Eastern Local Iron Ore

Cents per unit del., E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	24.00
North African hematities (spot)	26.00-28.00
Brazilian iron ore, 67-69% (spot)	32.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 85c-87c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$39.00-42.00
48% 3:1	44.00-45.00
48% no ratio	30.00-32.00

South African Transvaal

44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00

Brazilian

44% 25:1 lump	nom.

Domestic

(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb, molybdenum content, mines $1.00

REFRACTORIES

(Ceiling prices, effective Sept. 23, 1952, per 1000 units)

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89.00; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lochhaven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $99.30 Salina, Pa., $104.55; Niles, O., $109; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $99.30; Hays, Pa., $105.10; Niles, O., $107; E. Chicago, Ind., Joliet, Rockdale, Ill., $109.70; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $179.55; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $186.90.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Aisey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $69.30; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $92.40; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $127; Johnstown, Pa., $127.30; Clearfield, Pa., $135; St. Louis, $138; Athens, Tex., $140.90.

Nozzles

Reesdale, Pa., $203.20; Johnstown, Pa., $208.40; Clearfield, Pa., $219.45; St. Louis, $224.65; Athens, Tex., $225.20.

Runners

Reesdale, Pa., $158.20; Johnstown, Pa., $161.70; Clearfield, Pa., $168.60; St. Louis, $170.30; Athens, Tex., $174.40.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $166.30; Danville, Ill., $169.30.
60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $210.20; Danville, Ill., $213.20.
70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $244.85; Danville, Ill., $247.85; Clearfield, Pa., $252.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 10.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c, Deld. Spot add 0.25c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.). Contract, c.l. lump, bulk 7.0c per lb of alloy, c.l. packed 7.75c, ton lot 8.5c, less ton 9.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 14.50c per lb of briquet, carload packed 15.2c, ton 16.0c, less ton 16.9c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packed 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size — weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet, c.l. packed 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c, c.l. packed 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

Note: Current prices on chromium, silicon, vanadium, boron and tungsten alloys appeared on page 161, Dec. 1 issue; manganese and titanium alloys and "other" ferroalloys, page 171, Dec. 8.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Feb. 5, 1952.

STEELMAKING SCRAP COMPOSITE

Dec. 11	$43.00
Dec. 4	43.00
Nov., 1952	43.00
Dec., 1951	43.00
Dec., 1947	40.13

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin, and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Basing Point	Grade 1 No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.00	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	42.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2. No. 1 Busheling	Base
3. No. 1 Heavy Melting	—$1.00
4. No. 2 Heavy Melting	— 1.00
5. No. 2 Bundles	— 1.00
6. Machine Shop Turnings	10.00
7. Mixed Borings and Short Turnings	6.00
8. Shoveling Turnings	6.00
9. No. 2 Busheling	4.00
10. Cast Iron Borings	6.00

Elec. Furnace and Fdry. Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate	
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
Foundry, Steel	
20. 2 feet and under	Base
21. 1 foot and under	+ 2.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free Turnings	— 3.00
24. Heavy Turnings	— 1.00
25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	—10.00
29. Shafting	+10.00
31. Old Tin & Terne Plated Bundles	—10.00

Unprepared Grades

When compressed constitutes

32. No. 1 Bundles	— 6.00
33. No. 2 Bundles	— 9.00
34. Other than material suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for grades 12 and 8, respectively.

(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.

(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and acid open-hearth furnaces or foundries; or in basic O-H or blast furnace under NPA allocation or OPS authorization.

(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purposes.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 Railroad heavy melting steel) for other grades of railroad steel scrap:

2. No. 2 Heavy Melting Steel	—$2.00
3. No. 2 Steel Wheel	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats.	Base
5. No. 1 Busheling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, Switches	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or/steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Bolsters & Side Frames:	
22. Uncut	Base
23. Cut	+ 3.00
24. Angles, Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+12.00
26. Steel Wheels, No. 3, oversize	Base
27. Steel Wheels, No 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	— 8.00
32. Boilers	— 6.00
33. No. 2 Sheet Scrap	—13.00
34. Carsides, Doors, Car Ends, cut apart	— 6.00
35. Unassorted Iron & Steel	— 6.00
36. Unprepared scrap, not suitable for hydraulic compression	— 8.00

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer of industrial origin, authorized by OPS are:

(1) For preparing into Grades No. 3, No. 4 or No. 2, $8.

(2) For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.

(3) For crushing Grade No. 6, $3. For preparing into:

(4) Grade No. 25, $6.

(5) Grade No. 19, $6.

(6) Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.

(7) Grade No. 17 or No. 21, $11.

(8) Grade No. 18, $12.

(9) For hydraulically compressing Grade No. 15, $8.

(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.

(2) For hydraulically compressing Grade No. 13, $6. For preparing into:

(3) Grade No. 16, $4.

(4) Grade No. 17, $5.

(5) Grade No. 18, $7.

(6) Grade No. 21, $4.

(7) Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into Grade No. 7, $9.

(2) For preparing Grade No. 3 into Grade No. 11, $7.

(3) For preparing Grade No. 3 into Grade No. 1 $4

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:

1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop broken machinery	52.00

OPEN MARKET

(Delivered prices include broker's commission.)

Birmingham
(Delivered)

Shoveling turnings	$30.00-32.00
Cast iron borings	30.00-32.00
No. 1 cupola cast	47.00-48.00
Stove plate	42.00
Charging box cast	39.00-40.00
Heavy breakable	36.00-37.00
Drop broken machinery	42.00-43.00
Unstripped motor blocks	35.00-36.00

Boston
(F.o.b. shipping point)

No. 1 cupola cast	41.00
Heavy breakable	36.00
Stove plate	34.00-35.00
Unstripped motor blocks	30.00

Buffalo
(Delivered)

No. 1 heavy melting	43.00
No. 2 heavy melting	43.00
No. 1 bundles	44.00
No. 1 busheling	44.00
No. 2 bundles	43.00
Machine shop turnings	34.00
Mixed borings, turnings	38.00
Cast iron borings	38.00
Short shoveling turnings	38.00
No. 1 cupola cast	45.50-46.50
No. 1 machinery cast	49.00-50.00

Chicago
(Delivered)

No. 2 heavy melting	42.50
No. 2 bundles	42.50
Machine shop turnings	30.50-32.50
Mixed borings, turnings	34.50-36.50
Shoveling turnings	34.50-36.50
Cast iron borings	34.50-36.50
No. 1 cupola cast	44.00-46.00
Charging box cast	41.00-43.00
Heavy breakable	38.00-40.00
Burnt cast	37.00-39.00
Cast iron brake shoes	39.00-41.00
Stove plate	41.00-43.00
Clean auto cast	46.00-48.00
Unstripped motor blocks	35.00-37.00
Malleable	46.00-48.00
Drop broken machinery	47.00-49.00

Cleveland
(Delivered)

No. 1 heavy melting	43.00
No. 2 heavy melting	43.00
No. 1 bundles	44.00
No. 2 bundles	43.00
Machine shop turnings	34.00
Mixed borings, turnings	38.00
Shoveling turnings	38.00
Cast iron borings	38.00
(F.o.b. shipping point)	
No. 1 cupola	49.00
Charging box cast	47.00
Burnt cast	41.00
Stove plate	46.00
Clean auto cast	52.00
Unstripped motor blocks	43.00
Malleable	55.00
Drop broken machinery	52.00

Detroit
(F.o.b. shipping point)

No. 1 cupola cast	47.00-48.00
Heavy breakable	43.00-44.00
Clean auto cast	49.00-50.00
Unstripped motor blocks	40.00-41.00
Drop broken machinery	50.00-52.00
Charging box cast	44.00-45.00

Los Angeles
(Delivered)

No. 1 heavy melting	34.00
No. 2 heavy melting	29.00
No. 1 bundles	35.00
No. 2 bundles	29.00
No. 1 cupola cast	46.00
Machine shop turnings	14.00

New York
(Brokers' buying prices)

No. 2 heavy melting	35.99
Mixed borings, turnings	29.99
Machine shop turnings	25.99
Cupola cast	40.00-41.00
Unstripped motor blocks	31.00-32.00

Philadelphia

No. 1 heavy melting	41.50†
No. 2 heavy melting	41.50†
No. 1 bundles	42.50†
No. 2 bundles	41.50†
No. 1 busheling	42.50†
Mixed borings, turnings	36.50†
Machine shop turnings	32.50†
Short shoveling turnings	36.50†
No. 1 cupola cast	45.00-46.00††
Unstripped motor blocks	38.00††
Heavy breakable	47.50††
Machinery cast	52.00†
Charging box cast	47.50††

† Ceiling price. ‡Nominal.
§ Shipping point. ††Delivered.

Pittsburgh
(Delivered)

No. 2 heavy melting	44.00†
No. 1 bundles	45.00†
No. 2 bundles	44.00†
Machine shop turnings	35.00†
Shovel turnings	39.00†
No. 1 cupola cast	48.50
Heavy breakable	45.00

† Ceiling price.

San Francisco
(Delivered)

No. 2 heavy melting	29.00
Machine shop turnings	14.00
No. 2 bundles	29.00
No. 1 cupola cast	44.00

Seattle
(F.o.b. shipping point)

No. 1 bundles	30.00
No. 1 cupola cast	41.00
Heavy breakable	36.00-38.00
Unstripped motor blocks	31.00

St. Louis
(Delivered)

No. 1 cupola	48.00
Unstripped motor blocks	37.00

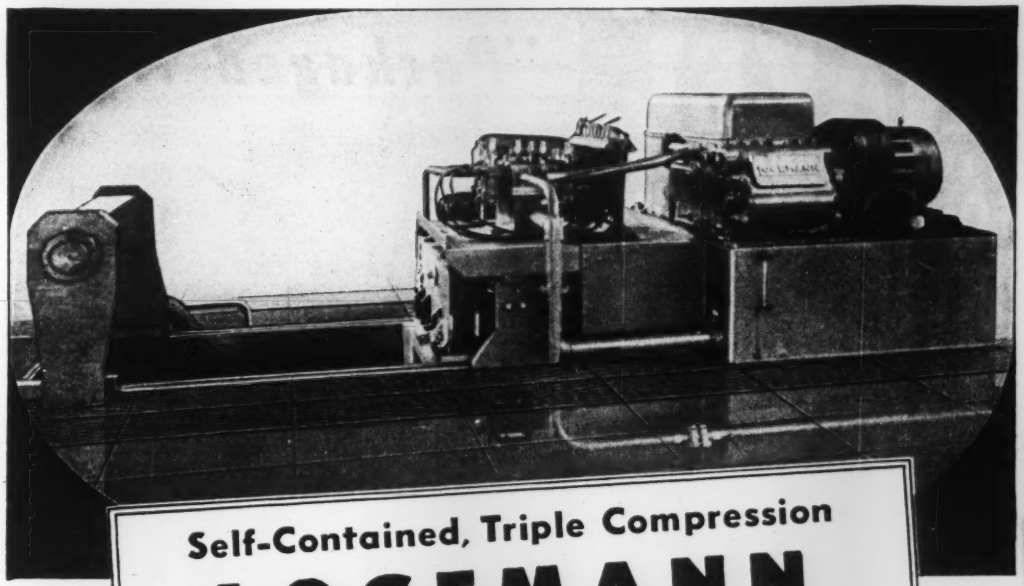
Youngstown
(Delivered)

No. 2 heavy melting	43.00
No. 2 bundles	43.00
Machine shop turnings	34.00

HAMILTON, ONT.
(Delivered Prices)

Heavy Melt.	$35.50
No. 1 Bundles	35.50
No. 2 Bundles	35.50
Mechanical Bundles	32.00
Mixed Steel Scrap	31.50
Mixed Borings, Turnings	32.50
Rails, Remelting	35.50
Rails, Rerolling	44.50
Busheling	30.00
Busheling new factory:	
Prep'd	33.50
Unprep'd	31.50
Short Steel Turnings	32.50
Cast Iron Grades†	
No. 1 Machinery Cast	50.00

†F.o.b., shipping point.



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. . . for pressures from 2000 to 50,000 p.s.i. for press operation, hydrostatic tests, and similar applications.

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Here is a combination of tried and tested units expertly assembled to reduce floor space requirements to a minimum. Features include a big box, high speed operation, and high density bales. Various box sizes are available to meet maximum scrap and minimum bale dimensions.

Also available are various sizes and types of pumps and operating valves to meet output requirements. Logemann Scrap Presses can be equipped with loading hopper in which the scrap charge can be prepared while the press is going through the operations on the preceding bale. Compressed bales are delivered at floor level for ejection to conveyor, steel chute, or into accumulation pit.

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. . . BECAUSE THEY'RE ENTIRELY SELF-CONTAINED

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The NAZEL Hammer can be started or stopped at the mere push of a button, and it uses power *only when working* (think what this means in comparison with other types of hammers).

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FREE CATALOG shows and explains why

1836

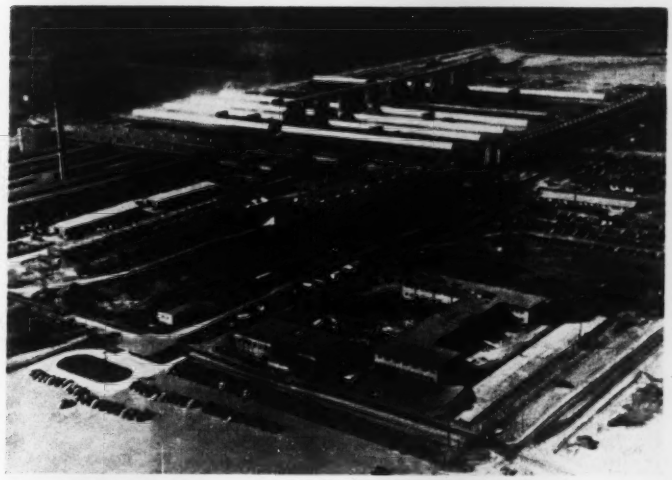
LOBDELL UNITED COMPANY

WILMINGTON 99, DELAWARE

A SUBSIDIARY OF UNITED ENGINEERING AND FOUNDRY COMPANY

1952

The Metal Market



New Plant Boosts Aluminum Production

An aerial view shows Aluminum Co. of America's new Rockdale, Tex., smelting works as production begins. When completed, installations will include a smelting plant with four pot lines, a carbon electrode manufacturing plant, a power plant for generation of electricity and lignite mining facilities. Large buildings in the upper center of the picture are pot rooms where aluminum is smelted from its ores

Movement of nonferrous metals, and particularly scrap, slows down as buyers and dealers enter the yearend inventory period. Spurt should come with the new year

PROMPT-DELIVERY buying of metals is undergoing its customary yearend letdown called the inventory period.

Little volume buying can be expected on readily-available metals or scrap till the calendar changes, but then activity should take on new vigor. This is particularly true of scrap, which has been sluggish for months. Dealers have shown little inclination to move the metal at current prices and tax rates.

In Particular — Aluminum, copper and copper alloy scrap just isn't being recirculated, despite inventory regulations. "It's simply buried till the right time or price comes along," says a buyer. "Enforcement of regulations is next to impossible."

Another way to beat the price penalty is to sell scrap abroad, where it brings up to one-third more than domestic ceilings. Most secondary metal is plentiful abroad and scrap flows freely. DPA decided to crack down on exports last week, ordering OIT and NPA to slap an embargo on copper scrap, a particularly vexing problem, for the rest of 1952.

Long Term — The most-used metals in industry can't be had for immediate delivery. Aluminum sheet mills, about 30 days behind on current orders, now quote May delivery. Heat treated strong alloys are especially tight. Aluminum and magnesium mill distributors are told by producers to expect 4-6 week delays in shipment. Carryover of aluminum mill products into 1953 is expected to amount to over 75,000 tons. Brass rod is still available for January delivery, but sheet and tube stretch well into February.

Lead and zinc products are freely available, but buying is limited. Galvanizers,' brass mills', and even die casters' business will strengthen demand for zinc. A more steady buying pace can be expected in about a month. November shipments to consumers—90,756 tons—set a postwar record. Producers' stocks skidded 13 per cent to 83,149 tons—about a month's production.

Lead market is strengthening enough to be considered fairly stable again. Domestic consumption is firm and European demand is beginning to pick up. Producers' stocks are no longer out of hand.

Copper Stockpiling Forecast

Watch for a marked increase in copper stockpiling in January. December tonnage earmarked for this purpose topped both October and November. "Substantial tonnages" for stockpile are expected by NPA to become available in January "through a new venture." Essential programs will not be cut back to meet the ultimate stockpile goal.

Looking Ahead to 1960

World civilian market demand for aluminum by 1960 will reach 3.3 million tons a year. So says Ward Van Alstyne, president, Aluminum Import Corp., Alcan's sales distributor. Current applications are topped by transportation, with building and construction a close second. Chief automotive potential is in torque converters, clutch housings, timing gears, carburetors.

Open Space on Order Boards

There's plenty of space on order boards of magnesium fabricators, in case you need forgings, castings, extrusions or sheet. Extrusions and sheet deliveries will take only 10-12 weeks. Cutbacks in B-36 requirements sharply reduced orders for magnesium sheet. Magnesium development engineers have been taking a close look at the cerium type of magnesium alloys because of their abilities to withstand very high pressures. Engine makers are studying applications of the thorium type of magnesium castings.

Precise Tube Straightening

A picture caption on this page in the Dec. 1 issue erroneously gave the impression that a rotary, guideless straightener made by Mackintosh-Hemphill Co., Pittsburgh, does not do a complete and finished job of tube-straightening.

The picture showed a Mackintosh-Hemphill machine at work in the French Small Tube Branch of American Brass Co., Waterbury, Conn. Plant officials bought the straightener in order to deliver brass and copper tube exactly to customers' specifications. No hand straightening is required.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 27.25c; 88-10-2 (No. 215) 40.00c; 80-10-10 (No. 305) 33.00c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 12.50c; brass special 12.75c; intermediate 13.00c; East St. Louis, high grade 13.85c, delivered.

Lead: Common 13.80c; chemical 13.90c; corroding 13.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 20.00c, pigs 19.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 18.80c; grade 2, 18.60c; grade 3, 18.40c; grade 4, 18.20c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American 99.8% and over but not meeting specifications below 34.50c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 35.00c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.56c; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, New York, $210-$212, nominal, per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.595 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms, $1.50-$2 del.; special or patented shapes $2.15.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 83.25c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $23-$24 per troy ounce.

Iridium: $175-$185 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill, effective July 1, 1952)

Sheet: Copper 45.52; yellow brass 40.17; commercial bronze, 95% 45.15; 90% 44.38; red brass, 85% 43.10; 80% 42.34; best quality, 41.35; nickel silver, 18% 55.08; phosphor-bronze grade A, 5% 64.71.

Rod: Copper, hot-rolled 41.37; cold-drawn 42.62; yellow brass free cutting, 33.85; commercial bronze 95% 44.84, 90% 44.07, red brass 85% 42.79, 80% 42.03.

Seamless Tubing: Copper 45.56; yellow brass 43.18; commercial bronze, 90% 47.04; red brass, 85% 46.01.

Wire: Yellow brass 40.46; commercial bronze, 95% 45.44, 90% 44.67; red brass, 85% 43.39; 80% 42.63; best quality brass, 41.64.

(Base prices, effective July 1, 1952)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 32.795; 30,000 lb lots, 32.92; l.c.l., 33.42. Weatherproof, 100,000 lb, 33.60; 30,000 lb, 33.85; l.c.l., 34.35. Magnet wire del., 15,000 lb or more, 38.75; l.c.l., 39.50.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders. Effective Aug. 4, 1952.)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	31.6	....	....
0.135-0.096	12-48	32.1	....	....
0.095-0.077	12-48	32.8	30.6	34.9
0.076-0.061	12-48	33.4	30.8	35.1
0.060-0.048	12-48	33.7	31.0	35.4
0.047-0.038	12-48	34.1	31.3	35.7
0.037-0.030	12-48	34.5	31.7	36.3
0.029-0.024	12-48	35.1	32.0	36.8
0.023-0.019	12-36	35.7	32.7	37.5
0.018-0.017	12-36	36.4	33.3	38.4
0.016-0.015	12-36	37.3	34.0	39.5
0.014	12-24	38.3	35.0	40.8
0.013-0.012	12-24	39.3	35.7	41.7
0.011	12-24	40.3	36.8	43.3
0.010-0.0095	12-24	41.4	37.9	44.8
0.009-0.0085	12-24	42.6	39.1	46.6
0.008-0.0075	12-24	44.0	40.3	48.4
0.007	12-18	45.5	41.7	50.6
0.006	12-18	47.0	43.1	55.4

* Lengths 72 to 180 inches. † Maximum diameter 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) of distance across flats	—Round— R317-T4 17S-T4	R-317-T4	—Hexagonal— 17S-T4
0.125	54.6	....	....
0.156-0.0188	46.2	....	....
0.219-0.313	43.6	....	....
0.375	42.0	48.3	50.4
0.406	42.0	....	....
0.438	42.0	48.3	50.4
0.469	42.0	....	....
0.500	42.0	48.3	50.4
0.531	42.0	....	....
0.563	42.0	....	47.3
0.594	42.0	....	....
0.625	42.0	45.7	47.3
0.688	42.0	....	47.3
0.750-1.000	41.0	43.1	44.6
1.063	41.0	....	43.1
1.125-1.500	39.4	41.5	43.1
1.563	38.9	....	....
1.625	38.3	....	41.5
1.688-2.000	38.3	....	....

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $19.00 per cwt; add 50c cwt 100 sq ft to 140 sq ft. Pipe: Full coils $19.00 per cwt. Traps and bends: List prices plus 43%.

ZINC

Sheets 23.00c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 20.75-21.75c; over 12-in., 20.75-21.75c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices f.o.b. mill)

Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $13; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

DAILY PRICE RECORD

1952	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Dec. 1-11	24.50	13.80	12.50	121.50	20.00	34.50	56.50	83.25
Nov. 24-29	24.50	13.80	12.50	121.50	20.00	34.50	56.50	83.25
Nov. 20-22	24.50	14.05	12.50	121.50	20.00	34.50	56.50	83.25
Nov. 12-19	24.50	14.30	12.50	121.50	20.00	34.50	56.50	83.25
Nov. 11	24.50	14.00	12.50	121.50	20.00	34.50	56.50	83.25
Nov. 3-10	24.50	13.80	12.50	121.50	20.00	34.50	56.50	83.25
Nov. 1	24.50	13.30	12.50	121.50	20.00	39.00	56.50	83.25
Nov. Avg.	24.50	13.965	12.50	121.50	20.00	34.688	56.50	83.25
Oct. Avg.	24.50	14.226	13.259	121.50	20.00	39.00	56.50	83.25
Sept. Avg.	24.50	15.50	13.99	121.50	20.00	39.00	56.50	83.25
Aug. Avg.	24.50	15.50	14.067	121.50	19.923	39.00	56.50	83.25
July Avg.	24.50	15.50	15.00	121.50	19.00	39.00	56.50	82.885
June Avg.	24.50	15.06	15.74	121.50	19.00	39.00	56.50	82.75
Dec. 1951 Avg.	24.50	18.50	19.50	103.00	19.00	50.00	56.50	88.00
Dec. 1947 Avg.	21.50	14.825	10.50	85.704	15.00	33.00	35.00	74.625

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb 75.50c; 3000 to 10,000 lb 76.50c; 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 300 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 300 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers 86.7c; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb, 69c; 2000 to 9900 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.42; 500 to 999 lb, $1.425; 200 to 499 lb, $1.43; less than 200 lb, $1.445. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, 98.5c; 100 lb kegs 99.5c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. Bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group 1: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material.

Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap; 2s solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50. Mixed plant scrap: Copper-free solids, 10.00; dual type, 9.00. Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Lead: Heavy 10.75-11.25; battery plates 5.90-6.15; linotype and stereotype 12.50-13.00; electrotype 10.75-11.00; mixed babbitt 13.75-14.00.

Zinc: Old zinc, 5.50-6.00; new die cast scrap, 5.50-6.00; old die cast scrap, 4.00-4.50.

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Wire . . .

Wire Prices, Page 181

Cleveland—Producers of nails and staples in this general area have adjusted their published price lists to reflect last summer's permitted increase on the basis of columnar listings rather than the dollars-and-cents figures originally authorized. The action was taken as result of approval by the Office of Price Stabilization giving recognition to the historical pricing practice in the industry.

Only slight changes in the listings of ceiling prices result, and considerable confusion in the pricing of these products is eliminated. Under the OPS regulation, effective Dec. 6, changes were authorized in listing stock wire nails, stock staples, woven fence, welded fence, wire netting, fence posts, coil and loop wire ties, barbed and twisted wire, and wire hoop.

Boston—Wire mill schedules on larger sizes are filled for first quarter, but there are openings for finer sizes and some high carbon specialties. Carryover will take up moderate volume of capacity, but on some finished products producers have caught up with demand, including wire nails, music and rope wire.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 179

Seattle—Local melting and rolling plants report reduced production due to forced 10 per cent curtailment in power. Mills have fairly large backlogs. Potential demand for reinforcing bars is large and is expected to reach peak about end of first quarter next year.

Sheets, Strip . . .

Sheet and Strip Prices, Page 179 & 180

Cleveland—Sheetmakers anticipate no trouble filling second quarter order books. Carryover from first quarter will be large, it is indicated, and while supply should be easier than at the turn of the year, tonnage is not expected to be freely available until third quarter. Surprisingly heavy demand has developed in recent weeks from the appliance makers while the automotive industry is pressing sellers for every possible ton. Lifting of controls, anticipated before midyear, will not change the supply situation much since it is indicated military, atomic energy and high-rated defense projects will continue to have first call on production. Some of the confusion in distribution is expected to be eliminated, however, and with more capacity scheduled to come in civilian goods manufacturers expect to fare considerably better in the way of supplies over coming months.

Boston—One sheet product making headway against heavy tide demand is galvanized. This grade is loosening up some. Other grades are taken for first quarter with some tickets for that period unplaced. Where second quarter tonnage is open early demand indicates no slackening through June. Perk-up in narrow cold strip has filled second quarter except for some specialties. Everything fabricated of flat-rolled for the automotive industry is under delivery pressure and to meet this some stampers are short of cold-finished. Straight chromium stainless buying is heavy, notably for automotive use.

New York—While some producers still have a little space open for stainless sheets in March, there recently has been a flurry in demand for straight chromium grades, in addition to strong pressure for nickel chromium. Stepping up in straight chromium demand is ascribed in part to the definite outlook for further tightening on restrictions on nickel chromium. Producers of carbon sheets are tightly booked up for first quarter, allowing for set-asides for military requirements.

Philadelphia—Indications point to highly sustained demand for hot and cold-rolled carbon sheets throughout first quarter and possibly well into the second. Manufacturers of household appliances are seeking more tonnage than they are receiving, with inventories at lowest ebb of the year. Meanwhile, automotive requirements are pressing. Silicon sheets are in tight supply.

Pittsburgh—Supply of sheet and strip is tight and is expected to remain so through first quarter. Books are not opened for second quarter yet. From inquiries mills have been receiving, it seems likely they will be filled in short order. Only mills having any open space, supply sheet at a premium. Interest in conversion tonnage is gaining, principally by the automotive field.

Chicago—Narrow cold-rolled strip is more easily available but no similar situation can be cited for any other light, flat-rolled product. Both hot and cold-rolled sheets and coated products are as tight as ever. Second quarter mill allotments will be less than hoped for earlier.

Semifinished Steel . . .

Semifinished Prices, Page 179

Sterling, Ill.—Northwestern Steel & Wire Co. is completing movement of its billet mill to a new location behind its 46-in. blooming and slabbing mill. This will make for a continuous operation and provide rolling facilities in excess of the company's normal requirements. Two-thirds of the company's additional ingot capacity has been completed by installation of two 150-ton electric furnaces, but it will be sometime in second quarter before it will have sufficient ingot capacity to schedule the blooming, slabbing and billet mills at full capacity.

Pittsburgh—As long as military demand continues strong for semifinished steel, forge shops are going to feel the pinch. Contributing to the tight situation is the automotive industry. While automotive demand holds up, semifinished output will be on a tight schedule.

Plates . . .

Plate Prices, Page 179

Boston—Carbon plate supply has improved on sizes in limited demand, 12 to 36-in. Narrower and heavier-wider tonnage is tightening with demand strong. Capacity is taken for first quarter on quality grades also, including low alloy. Military set-asides, against which high ratings apply, are taken and considerable volume of heavy plates to move in next quarter will be against Z-2.

New York—Although some producers as recently as a month ago

Steel Ingot Output Establishes November Record

STEEL MILLS maintained their record production pace last month, pouring more ingots and steel for castings than in any previous like month. It was the second largest total for any month, having been exceeded only by that in October.

Production in November is estimated at 9,446,000 net tons compared with 9,806,830 tons in October and 8,799,352 tons in November 1951. Mills operated at 106 per cent of capacity, says the American Iron & Steel Institute, New York. This represents a decline of 0.6 per cent from the October rate.

Total production for the first 11 months of this year came to 83,473,327 tons compared with 96,309,170 tons for the like period a year ago. The decline is attributed to the mid-year strike.

	OPEN-HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production (Net tons)	No. of weeks in mos.
1952	Net tons	% of capac-ity	Net tons	% of capac-ity	Net tons	% of capac-ity	Net tons	% of capac-ity		
January	8,103,123	100.7	407,298	89.3	625,696	89.7	9,136,117	99.3	2,062,329	4.43
February	7,703,066	102.4	382,712	89.8	571,432	87.6	8,657,210	100.7	2,091,114	4.14
March	8,401,140	104.4	378,861	83.1	624,190	89.5	9,404,191	102.2	2,122,842	4.43
1st Qtr	24,207,329	102.5	1,168,871	87.4	1,821,318	89.0	27,197,518	100.7	2,092,117	13.00
April	7,101,199	91.1	323,006	73.2	566,937	83.9	7,991,142	89.7	1,862,737	4.29
May	7,291,865	90.6	318,642	69.9	594,089	85.2	8,204,596	89.2	1,852,053	4.43
June	1,446,927	18.6	22,862	5.2	169,702	25.1	1,639,491	18.4	382,166	4.29
2nd Qtr	15,839,991	67.0	664,510	49.6	1,330,728	65.0	17,835,229	66.0	1,370,886	13.01
1st 6 Mos.	40,047,320	84.8	1,833,381	68.5	3,152,046	77.0	45,032,747	83.4	1,731,363	26.01
July	1,347,587	16.8	2,000	0.4	277,371	39.8	1,626,958	17.7	368,090	4.42
August	7,599,888	94.4	309,361	67.8	589,438	84.5	8,498,687	92.4	1,918,440	4.43
September	8,039,128	103.4	351,620	79.8	671,357	99.6	9,062,105	101.9	2,117,314	4.28
3rd Qtr	16,986,603	71.2	662,981	49.1	1,538,166	74.4	19,187,750	70.4	1,461,367	13.13
9 Mos.	57,033,923	80.2	2,496,362	62.0	4,690,212	76.1	64,220,497	79.0	1,640,789	39.14
October	8,747,640	108.7	347,042	76.1	712,148	102.1	9,806,830	106.6	2,213,731	4.43
†November	8,402,000	107.8	337,000	76.3	707,000	104.7	9,446,000	106.0	2,202,000	4.29
1951										
9 Mos.	69,501,122	102.0	3,624,033	86.2	5,262,777	93.1	78,387,932	100.5	2,009,947	39.00
November	7,750,845	103.5	411,954	89.1	636,553	102.4	8,799,352	102.6	2,051,131	4.29

Note—The percentages of capacity operated in 1952 are calculated on weekly capacities of 1,816,637 net tons open-hearth, 102,926 net tons bessemer and 157,477 net tons electric ingots and steel for castings; total 2,077,040 net tons; based on annual capacities as of Jan. 1, 1952, as follows: Open-hearth 94,973,780 net tons; bessemer 5,381,000 net tons; electric 8,232,890 net tons; total 108,587,670 net tons. The percentages of capacity operated in 1951 are calculated on weekly capacities of 1,746,337 net tons open-hearth, 107,806 net tons bessemer, 144,891 net tons electric ingots and steel for castings, total 1,999,034 net tons; based on annual capacities as of Jan. 1, 1951, as follows: Open-hearth 91,054,020 net tons, bessemer 5,621,000 net tons, electric 7,554,630 net tons; total 104,229,650 net tons.

† Preliminary figures, subject to revision.

were anticipating a letup in demand in second quarter, they are now less certain. Pressure for sheared and universal plates continues strong and the long range outlook appears more promising.

Philadelphia—While purchases are limited there is increasing interest in foreign plates, even though they are being offered mostly in the lighter gages. Japan has been a recent seller. Prices are above the domestic market but are not greatly out of line. Most domestic mills have been able to accept only a limited amount of new non-defense tonnage in first quarter. Recent mechanical difficulties with the 206-in. mill of Lukens Steel Co. apparently have been ironed out. The Claymont, Del., producer is making progress eliminating bugs in its new equipment.

Tubular Goods . . .

Tubular Goods Prices, Page 183

Boston—Scheduling of pressure and mechanical tubing for second quarter has started with demand strong. Distributors are taking buttweld pipe allotments through February, but stocks are building up. With few exceptions producers are booked through first quarter on direct shipments, but utilities manage to edge in with carlots at times. Seamless pipe stocks are lowest in smaller sizes, 10-in. and under. Soft spot in tubular products is light gage strip electrical welded tubing. Prices are being shaded. Estimates are in on 7000 tons, 14-in. o.d. pipe, piling for a Boston pier.

Seattle—Increased interest is apparent in cast iron pipe as larger buyers seek supplies for 1953.

Steel Bars . . .

Bar Prices, Page 179

Pittsburgh—Steel bar customers are getting steel, but not the way they would like it. In about two weeks books will open for second quarter. Military set-asides of 27 per cent will cream off the top of available steel, and the line is already forming for what is left. The new bar mill of Jones & Laughlin, while tempering anxiety of bar consumers who expect it to help them out, will not be in full operation until first quarter, and then will produce only small diameter bars—up to one inch.

Boston—Only on military set-asides, mostly smaller sizes, are there openings for carbon bars first quarter. Heavy commercial demand also fills bessemer and resulphurized capacity while numerous consumers are unable to place orders covering all first quarter tickets. Converters are taking allotments 100 per cent and in some cases getting additional tonnage. Books are open for second quarter on alloys and in more cases hot-rolled carbon. In view of allotments to warehouses, converters and military set-asides, not much additional bar tonnage is in sight. Springfield arsenal has placed about 1300 tons, mostly forging stock.

Philadelphia—No letup is noted in demand for carbon bars, hot or cold. Military demands for cold-drawn carbon bars are being stepped up, thus placing a further squeeze on supplies for commercial needs. Some cold mills are booked well into second quarter.

New York—Carbon bar producers

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confront continued stiff demand for practically all sizes, but particularly for the larger rounds required especially for shell work. Within another week or two mills generally will open books for second quarter. Most sellers anticipate an active market throughout first and second quarters.

Los Angeles—Demand for carbon bars in small sizes has eased but larger sizes continue scarce. Aircraft parts fabricators' alloy bar needs are down due to schedule stretchouts.

Structural Shapes . . .

Structural Shape Prices, Page 179

Boston—Structural shops are scheduled up to allotments. An increase in allotment would quicken deliveries on fabricated work. Currently they range from June to August when tied to structural mill schedules. Where plain material is available from stock, shipments can be made by April, but prices for work in this category are higher. First quarter tickets find no openings for that period in numerous cases.

New York—Structural activity remains spotty. Commercial work is lacking in volume, due in part to governmental restrictions. Public work, reflecting perhaps seasonal influences, is not as brisk as it was. However, the great percentage of such work as is being figured is of this latter character, particularly bridge work.

Pittsburgh—Demand for structural shapes will remain strong through first quarter, and probably into second quarter. Supply to car builders is down and there are isolated cases of impending shutdowns though no immediate threat to car production is reported. Building construction has been getting a reasonable supply of structurals.

Seattle—Fabricators are cutting corners to save power. No extended layoffs are reported. One large plant cut the working week to five days.

Tin Plate . . .

Tin Plate Prices, Page 180

Pittsburgh—Supply of tin plate in the Pittsburgh area is tight, and warehouses, large and small can manufacturers are feeling the pinch. While an easing is expected during the latter part of second quarter, much relief for tin plate consumers is problematical. Currently, inventories are low.

Iron Ore . . .

Iron Ore Prices, Page 185

Cleveland—Lake shippers moved 74,910,798 gross tons of iron ore from the head of the lakes in the 1952 shipping season. This was only 89,202 tons under the season's goal of 75 million tons, but it was 14,181,214 tons fewer than the 89,092,012 gross tons shipped in the 1951 season. In the closing week of the season 411,704 tons were moved compared with 790,633 in 1951.

At the beginning of the 1952 season the shipment goal had been pegged at 96 million tons. This, however, was revised downward to 75 million when the steel strike idled the lake fleet for 55 days resulting in a tonnage loss of some 24 million tons at the height of the shipping season.

Part of this loss was made up following the strike by accelerated vessel movement and shipments all-rail, but stocks on lower lake docks and at furnaces are down from a year ago, being estimated at around 50 million tons compared with 54.9 million at yearend, 1951. It is indicated, however, that despite larger iron producing capacity, ore stocks will be adequate to support capacity furnace operations beyond the opening of the 1953 navigation season. Lake shippers now are setting their sights on moving 106 million tons next year.

Pig Iron . . .

Pig Iron Prices, Page 178

Chicago—Some improvement is noted in foundry operations, particularly gray iron jobbing shops dependent upon civilian hard goods industires. Household appliance industry continues to accelerate and is projecting expanded schedules for first quarter. Thus increased releases for castings. Pig iron, while not easy, is ample to meet current and nearfuture needs.

Boston—Until Mystic furnace is back in blast, now expected the week of Jan. 18, consumers of foundry iron will be carried along by stock shipments from Everett and slightly higher deliveries from New York and outside furnaces. Tonnage offered by the latter is heavier. Inventory and supply position with basic melters has reached the point where buying is geared to consumption to maintain current stock levels. Foundry coke demand is slow. Price has advanced to $26.05 delivered within $4.15 freight range.

Buffalo—Buffalo district blast furnace operations declined 6 points to 88 per cent of capacity last week as Republic Steel Corp. idled one furnace for relining. The stack will be down for about three weeks. Demand for merchant iron continues brisk.

Philadelphia—Foundry iron continues in easy supply due to slower operations at most gray iron shops, a lag that is expected to become more pronounced during the holiday season. Coke shipments also reflect this situation. Several requests for deferment of deliveries are noted.

Pittsburgh—Pig iron availability in the Pittsburgh district was increased by 1000 tons per day last week as Crucible Steel Co. of America blew in its new blast furnace at the Midland works. The furnace is the tallest presently operating in the district. It measures 245 ft from ground level to the top of the furnace. To feed this new furnace, 29 new coke ovens are now in operation. Crucible's coke production has been increased from 675,000 tons to 832,000 tons.

Cleveland—While some merchant iron sellers report consuming pressure off from that of recent months, others report they find the market situation just as tight as ever. While some foundries have not been pressing for iron, others on defense work have been taking all the tonnage offered them. Lifting of the 30-day inventory restriction, it is said, would result in an influx of orders to the furnaces which could not be promptly satisfied.

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Metallurgical Coke . . .

Metallurgical Coke Prices, Page 183

Pittsburgh—Consumers' stocks of coke are high, and little chance of a shortage exists. With the present rate of blast furnace expansion, the point has been reached where there are more blast furnaces than coke oven capacity. Coke oven expansion and rehabilitation, generally, has not kept pace with furnace increases. A good proportion of coke ovens in the Pittsburgh area need servicing.

Scrap . . .

Scrap Prices, Page 186

Philadelphia—While steel scrap prices continue at ceiling, cast grades show further weakness. No. 1 cupola cast is holding at $45 to $46 delivered, unstripped motor blocks at $38 delivered, and heavy breakable and charging box cast at $47 delivered. These easier prices reflect the lag in gray iron foundry operations.

Boston—Continued weakness and lack of buying of cast scrap depress general activity. Steel scrap consumers are content to hold inventories at present levels and are taking shipments at about the rate of consumption. Prices are at ceiling, from yard to consumer. Cast prices are weaker; No. 1 cupola cast is around $12 per ton under ceiling and most other cast grades in that ratio. Yards are well stocked with cast.

New York—Brokers have reduced buying prices on cupola cast to $40 to $41, and unstripped motor blocks to $31 to $32. Sluggish demand due to further easing in foundry operations is the cause of the price weakness. Offerings of steelmaking scrap remain at ceiling. Consuming demand is strong.

Buffalo—Although no signs of weakness appear, supplies of steelmaking scrap are sufficient to enable the mills to add substantially to reserve stocks. The mills have placed new business at ceiling levels. Influx of scrap by water continues. Week's receipts included 10,000 tons from upper lake ports. Cast scrap continues easy.

Pittsburgh—Scrap movement in the Pittsburgh area is slow. Dealers are moving some tonnage but not in large quantities. Mills are in no immediate need of scrap. Stocks are good. U. S. Steel has an estimated 70-days' supply, Jones & Laughlin can go along for about 90 days. Pittsburgh Steel's inventory is estimated at 40 days.

Cleveland—With the mills holding comfortable stocks no shortage of scrap is anticipated over coming months such as has been experienced in recent past winters. Currently, steelmaking grades continue to move steadily from dealers' yards and manufacturing plants to the mills, serving to maintain mill inventories in the face of capacity-plus operations.

Chicago—Despite a steelmaking rate which has averaged close to 110 per cent of capacity for the past 10 weeks, there has been no scrap supply problem. Mill inventories range well over 60 days. Receipts under contract, including both dealer and industrial material, pretty well balance consumption. Foundry scrap continues weak as result of generous supplies and limited demand.

St. Louis—Scrap market continues in the doldrums. Shipments have dried

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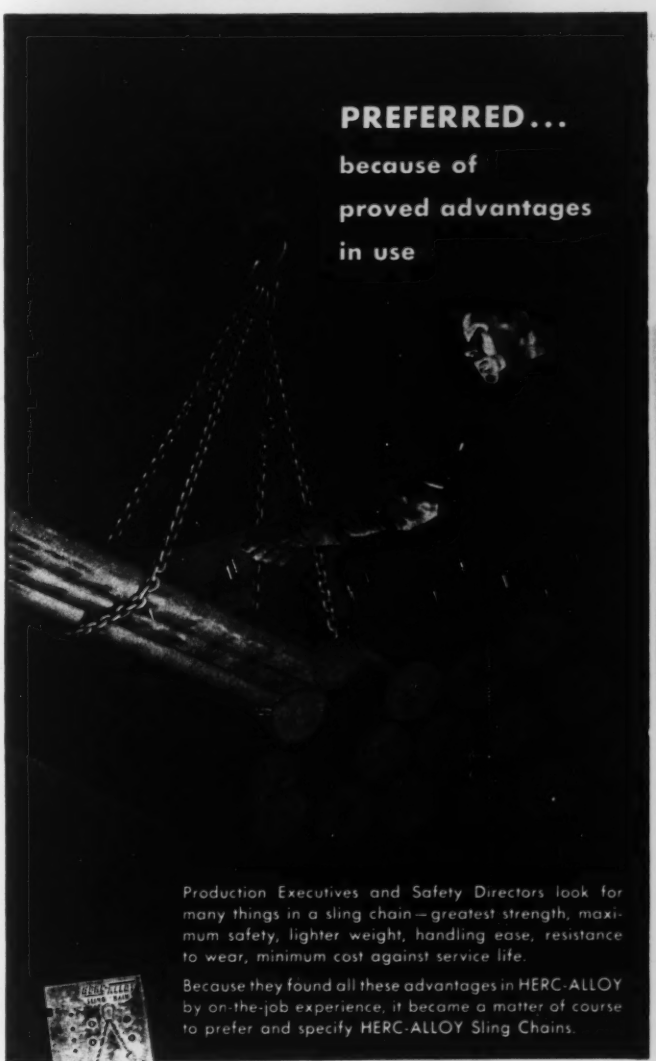

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up noticeably. Mills are glad to place orders whenever assured brokers can deliver but delivery guarantees are seldom forthcoming. So order placements are scarce. Mills are comfortably stocked, however, averaging around 40-days stocks. Cast scrap market is slower. Some foundries are on a two-day week and are buying scrap by the truckload instead of carload. Melting steel prices are firm.

Birmingham—The district's scrap market remains comparatively inactive. Most takers of melting steel are from without the state.

Los Angeles—Mills are checking scrap quality carefully indicating mills' stocks are growing. Prices are soft and No. 2 heavy melting slid to $29 when one large producer went out of the market.

Seattle—Large buyers report better scrap is coming to this market. Volume is sufficient to cover current consumption. Inventories are rising slowly.

Warehouse . . .

Warehouse Prices, Page 185

Pittsburgh—Business is good at Pittsburgh district warehouses. None of them boast balanced stocks. Receipts are good from mills, but not in the variety needed. Certain gage plates and larger diameter bars are not as plentiful as warehouses and customers would like. Some slackening in customer demand is expected because of yearend closings.

Cleveland—Local warehouses are booking business steadily but they anticipate some letdown in ordering over the holidays. While they have been receiving substantial tonnage from the mills ever since the steel strike ended, distributors' stocks continue unbalanced. Not much improvement in the situation is expected until second quarter at earliest, and still later on large bars and heavy plates, which are under demand pressure from the defense industries.

Chicago—Warehouse stocks average around 50 per cent of normal compared with 30 per cent after the steel strike. This pickup is less than had been expected. Demand is increasing in some directions. Improvement in stocks is concentrated in slower moving items like wire products, narrow cold-rolled strip and hot and cold-drawn bars under 1-in. diameter.

San Francisco—Warehouse steel stocks are reported to have gained a little in recent weeks. Inventories now are estimated between 35 and 40 per cent of normal. Wet weather has slowed demand somewhat.

Seattle—Warehouse volume is larger than normal for this season. Inventories are unbalanced although some items are in improved supply. Prices continue steady.

Rails, Cars . . .

Track Material Prices, Page 181

New York—Domestic freight car orders in November totaled 2878 cars and placed the backlog as of Dec. 1, at 87,657, according to announcement by the American Railway Car Institute and the Association of American Railroads. Of the total placed last month car builders received 2466 cars and railroad shops 412. Reflecting slight increase in availability of steel. November deliveries of domestic freight cars amounted to 5929, against 5437 for October. In November 1951, deliveries amounted to 9824.

Canada . . .

Ottawa, Ont.—Prices paid for cobalt in Canada were marked down, effective Dec. 1, Deloro Smelting & Refining Co., purchasing agent for the Canadian government stockpile, announced the following prices:

Cobalt metal—500 pounds or over delivered in keg lots, $2.43 per pound; under 500 pounds, $2.43 per pound, ex-stores. Previous price was $2.52 per pound.

Cobalt oxide—(70-71% cobalt content)—$1.81 per pound delivered in 350-pound containers; less than keg lots, $1.83 per pound ex-stores. Previous price, $1.90 per pound.

Cobalt sulphate—(35-36% cobalt content)—99 cents per pound delivered in 440-pound containers. Previous price, $1.05 per pound.

Toronto, Ont.—Production of primary iron and steel shapes in Canada in August amounted to 357,252 net tons, comparing with 386,054 tons in July and 387,599 in August, 1951.

Shipments for sale in August included 471 tons of semifinished shapes; 15,101 structurals; 17,868 plates; 20,516 rails; 6259 tie plates and track materials; 33,329 hot rolled bars; 20,133 pipes and tubes; 27,622 wire rods; 22,749 black sheets; 8333 galvanized sheets; 9606 castings, and 40,887 other rolled products.

Hamilton, Ont.—The largest blast furnace in Canada was placed in operation last week at the Steel Co. of Canada Ltd. The new furnace will produce 1400 tons of pig iron daily when it reaches full production. Late in the week the company put into operation four new 275-ton open-hearth furnaces.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

615 tons, single span curved chord Pratt truss bridge with 321-foot square span, Housatonic river, New Milford, Conn., to Bethlehem Steel Co.; Mariani Construction Co., New Haven, Conn., general contractor.

370 tons, alterations, building No. 55, Frankford arsenal, Philadelphia, to Cantley & Co., Philadelphia.

150 tons, State Firemen's Training School, Lewistown, Pa., to Goetze Welding Co., Harrisburg, Pa.

150 tons, extension building No. 34, Rohm & Haas Co., Bristol, Pa., to Max Corchin & Son, Philadelphia.

135 tons, state highway bridge, Albany county, New York, to Bethlehem Steel Co.; White Oak Excavators Inc., Plainville, Conn., general contractor; reinforcing to Truscon Steel Division, Republic Steel Corp., Cleveland.

100 tons, Acme supermarket, Philadelphia, to Bethlehem Fabricators, Bethelhem, Pa.

STRUCTURAL STEEL PENDING

2500 tons, two maintenance hangars, airfield base, Lincoln, Nebr.

2000 tons, aircraft maintenance hangar, McGuire Air Force Base, Ft. Dix, N. J.; bids to be closed by Philadelphia Disstrict Army Engineers Jan. 7.

1542 tons, state bridge work, Allegheny county, Pa., bids Dec. 30; also 1137 tons of reinforcing bars.

1500 tons, hangar and shops, Robins airfield base, Houston county, Georgia.

1100 tons, addition to Sound Pulp & Paper Co. plant, Everett, Wash.; bids in to Scott Paper Co., Boston, Mass.

1000 tons, warehouse, Ft. Dix, N.J., bids

NON-FLUID OIL

TRADE MARK REGISTERED

Provides Positive Bearing Protection

Dripping, leaking oil cuts production. It won't stay in bearings, so does not lubricate dependably and needs frequent application. Bearings run hot and often burn out.

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WAREHOUSES: Atlanta, Ga. • Birmingham, Ala. • Charlotte, N. C. • Chicago, Ill. Columbus, Ga. • Detroit, Mich. • Greensboro, N. C. • Greenville, S. C. • Providence, R. I. • St. Louis, Mo.—Also represented in most other industrial centers, including Cleveland, Ohio—Cincinnati, Ohio—Philadelphia, Pa.—Pittsburgh, Pa.—Syracuse, N. Y.

NON-FLUID OIL is not the name of a general class of lubricants, but is a specific product of our manufacture

to be closed by Philadelphia District Army Engineers, Jan. 16.

800 tons, Market St. extension, municipal subway, Philadelphia, Kaufman Construction Co., Philadephia, low on general contract.

350 tons, three-span continuous deck girder bridge, Deerfield river, Readsboro, Vt; bids Dec. 19, Montpelier.

230 tons, also 40 tons reinforcing, Washington state Nisqually river bridge; bids to Olympia, Dec. 16.

115 tons, stringer bridge, Lincoln, R. I.; bids Dec. 17, Providence, R. I.

100 tons, double trolley traveling bridge crane, Dexter dam powerhouse; bids to U. S. Engineer, Portland, Oreg., Jan. 6.

REINFORCING BARS . . .

REINFORCING BARS PLACED

770 tons, state highway bridges, New York thruway, Oneida county, New York, to Joseph T. Ryerson & Son Inc., New York, through Arute Bros. Inc., New Britain, Conn., general contractor.

340 tons, state highway bridge, Hopkinton-Richmond, R. I., to Plantations Steel Co., Providence, R. I.; General Engineering & Construction Co., Providence, general contractor; structurals to Providence Steel & Iron Co., Providence.

200 tons, Tacoma light department garage, general contract bids opened Dec. 8.

100 tons, bridge, Housatonic river, New Milford, Conn., to Bethlehem Steel Co., Mariani Construction Co., New Haven, Conn., general contractor; also 220 tons, steel piling to Bethlehem Steel Co.

REINFORCING BARS PENDING

3300 tons, Grant park (north) garage, Chicago; bids Jan. 8, Director of Purchases, Chicago Park district; also 800 tons, steel sheet piling.

500 tons, plus 400-bed Air Force hospital, Elmendorf Field, Alaska; bids to U. S. Engineer, Seattle, Jan. 14.

450 tons, Washington state Fox Island bridge, 1649 feet in length; bids to Olympia, Dec. 23.

165 tons, Corps of Engineers, Pittsburgh; bids in.

125 tons, Washington state slab bridges, Clark county; bids to Olympia, Dec. 16.

125 tons, slab and girder bridges, Washington state road projects; bids to Olympia, Dec. 16.

100 tons, including concrete pipe, also 75 tons shapes, laterals, wasteway, pumping plant, etc., Potholes east canal, Columbia Basin project; bids to Bureau of Reclamation, Ephrata, Wash., Dec. 30.

PIPE . . .

STEEL PIPE PENDING

7000 tons, 14-in. o.d., piling, Commonwealth pier No. 1, Boston.

125 tons, 6-in., Brockton-Taunton Gas Co., Taunton, Mass.

PLATES . . .

PLATES PENDING

510 tons, Corps of Engineers, Mobile, Ala., also 100 tons steel angles; bids in.

RAILS, CARS . . .

LOCOMOTIVES PENDING

Northern Pacific to add eight diesel locomotives at cost of $1 million.

RAILROAD CARS PLACED

Baltimore & Ohio, 11 all-room sleeping cars, to Budd Co., Philadelphia.

Canadian National Railways, freight and passenger cars valued at $34,248,000; orders placed with Canadian Car & Foundry Co., Montreal, Que.; National Steel Car Corp., Hamilton, Ont.; and Eastern Car Co., Sydney, N. S.

RAILROAD CARS PENDING

Northern Pacific, $23 million equipment and improvement budget, 60 per cent passenger and freight cars for 1953; passenger equipment will cost $6,150,000 and freight equipment $7 million.

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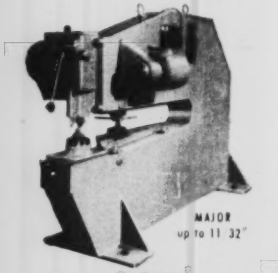
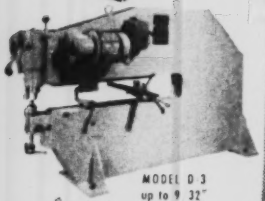
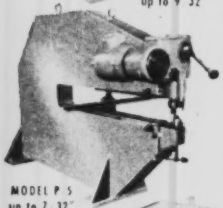


MAJOR up to 11 32"



MODEL D-3 up to 9 32"



MODEL P-5 up to 7 32"

MODEL P-3 up to 5 32"

MODEL AM & AL up to 16 ga

Pullmax Trimmer for trimming excess metal from bulky stampings up to 5 32"

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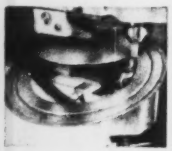

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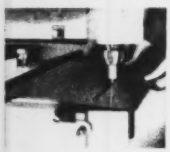

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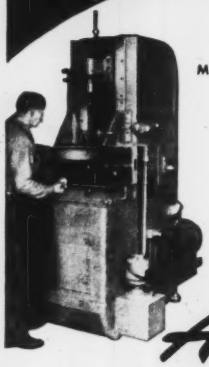

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Here and There in Metalworking . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Vanadium Corp. Opens Ohio Plant

Production of alloys was started Nov. 25 at the $2.5 million plant of Vanadium Corp. of America near Cambridge, O. The plant is located about 100 miles from the company's new $8 million alloy producing plant at Graham, W. Va. The facilities include three low frequency induction furnaces previously operated at the company's leased Chester, Pa., plant which was returned to the government for reactivation by the Air Corps. At the present time, activities at the Ohio plant are confined largely to the manufacture of aluminum alloys. A pilot plant for experimental work in aluminum and alloy metal production is scheduled to be built. Ferrovanadium, grainal alloys, low-carbon ferrotitanium and other alloys will be produced when construction of the plant is completed next year. An addition is being made to the company's Graham plant at an estimated cost of $3.5 million to permit production of very low carbon ferrochrome, a high quality alloy necessary for new types of high-temperature resistant steels and certain types of stainless steels.

New York SDPA Office Moved

Regional office, Small Defense Plants Administration, moved to 2 Park Ave., New York. Casper H. Citron is the regional director.

Delta-Star Merges with H. K. Porter

Delta-Star Electric Co., Chicago, was merged into the parent company, H. K. Porter Co. Inc., Pittsburgh, and will operate as Delta-Star Electric Division. C. S. Beattie, general manager of the division, and R. E. Anderson were elected vice presidents of the parent company.

Machinery Maker Expands Facilities

A. K. Robins & Co. Inc., Lombard and Concord streets, Baltimore, maker of canning machinery and bakery equipment, completely rebuilt the former Baltimore Forge Co. building, Key Highway and Battery avenue, for extended activities.

Nesco Inc. Plans Expansion

Allegheny Corp., Cleveland, purchased from Arthur Keating and his family a portion of their holdings in Nesco Inc., Milwaukee, manufacturer of housewares, ammunition components and steel containers for the oil and chemical industries. Nesco will undertake a long-term expansion program through acquisition of additional properties and development of new products.

J & S Tool Triples Facilities

J & S Tool Co. Inc., East Orange, N. J., is building a plant at Livingston, N. J., tripling its present facilities. Equipment will be installed for the high-speed precision production of wheel dressers, jaw clamps, precision grinding vises and other machine shop equipment. The new plant is scheduled to be in full operation by the first of the year.

Ferry Cap Acquires More Plant Space

Ferry Cap & Set Screw Co., Cleveland, purchased the building of Ohio Machine & Boiler Co., that city. Ferry Cap will go into production at the Ohio Machine plant, which covers 41,000 sq ft, in about six months. Ferry Cap is reselling the plant's equipment, trade name and operating business to E. Paul Simon, son of the president and founder of Ohio Machine. The latter firm will be relocated in larger quarters.

Filtrol To Build $5 Million Plant

Filtrol Corp. will construct a $5 million plant in Vernon, Calif., to produce alumina catalyst, stabilized alumina catalyst, impregnated alumina catalyst, and ammonium sulphate fertilizer. The firm under the direction of Wright W. Gary, president, also has a plant at 3250 E. Washington Blvd., Los Angeles. Completion is scheduled by 1953.

Syntron Opens St. Louis Store

Syntron St. Louis Sales Co. opened a store at 4431 Manchester Ave., St. Louis. This company represents Syntron Co., Homer City, Pa., manufacturer of vibratory material handling equipment, power tools, selenium rectifiers, paper joggers, shaft seals, etc.

Sightmaster Forms Subsidiary

Sightmaster Corp., New Rochelle, N. Y., incorporated a subsidiary firm, Sightmaster of California Co., with laboratory and foundry at Gillespie airport, Santee, Calif. The new firm is a consolidation of three electronic and metallurgical facilities: Electronic Division of Transport Products Corp., railway and signal manufacturing company; Technical Products & Services Co., owner of numerous electronic developments and services; Chemalloy Associates, developers of Chemalloy metal, which is used for fluxless soldering and welding of

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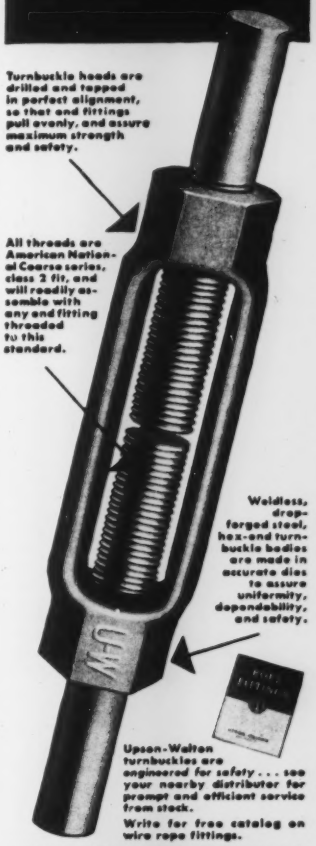
UPSON-WALTON turnbuckles


Turnbuckle heads are drilled and tapped in perfect alignment, so that end fittings pull evenly, and assure maximum strength and safety.
All threads are American National Coarse series, class 2 fit, and will readily assemble with any end fitting threaded to this standard.
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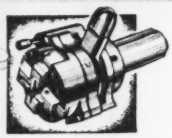

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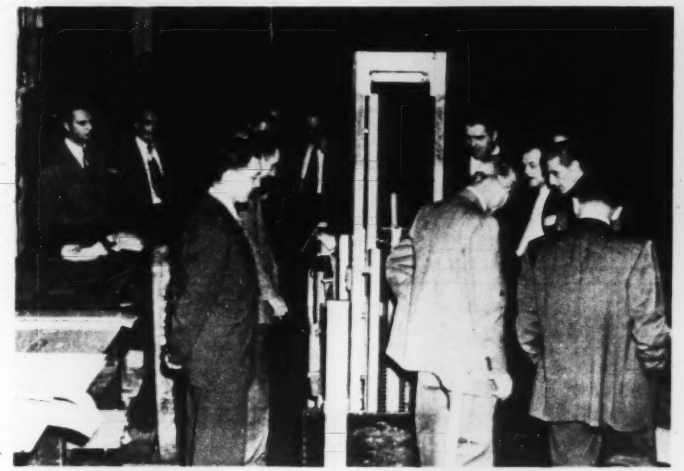

Materials Handlers Inspect Plant

At Chicago, members of the Chicago Chapter of the American Material Handling Society Inc. make periodic tours in carrying out the group's educational program. Here they inspect an electric power lift truck at the Automatic Transportation Co. plant. About 100 materials handling engineers toured the factory

aluminum and zinc metals and alloys, and a related group of special dry bearing and anti-friction metals.

Martin To Install Plating Facilities

Glenn L. Martin Co., Middle River, Md., plans to start work at once on construction of a 40,000 sq ft plant in the basement area of its No. 2 plant. This new "plant within a plant" will be equipped for plating airplane parts.

Allis-Chalmers Appoints Distributor

Allis-Chalmers Mfg. Co., Milwaukee, appointed Ohio Electric Supply Co., Youngstown, as a distributor for its pumps and drive equipment.

Aluminum Import Corp. Opens Office

Aluminum Import Corp., United States sales distributor for Aluminum Co. of Canada Ltd., opened a sales office at 510 W. Sixth St., Los Angeles. Roy A. Gentles is in charge of the office.

Columbia Machinery Buys Two Firms

Columbia Machinery & Engineering Corp., New York, acquired all of the assets and manufacturing rights of Bridgeport Safety Emery Wheel Co. Inc., Bridgeport, Conn., and Diamond Machine Co., Stratford, Conn. Columbia plans to integrate the two Connecticut companies, for the time being, with its Hamilton, O., Division. Columbia will continue the manufacture of the full Bridgeport line of medium and heavy hydraulic face grinders, vertical spindle surface grinders, knife grinders, pedestal grinders and abrasive cut-off saws. For the present, Columbia's activi-

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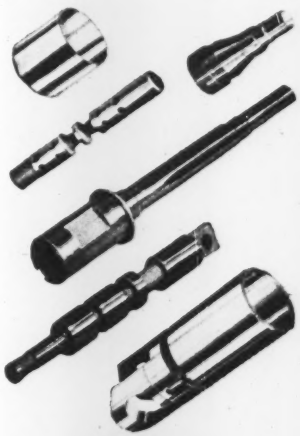

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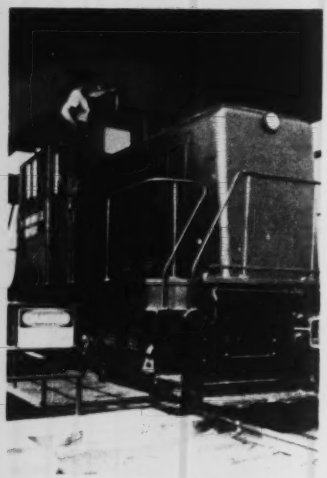

Tight Fit for Locomotive

General Electric Co. stair-stepped one side of the operator's cab of th s new 65-ton diesel-electric locomotive to fit a car dumper. Ohio Power Co. bought the locomotive, built by G. E., for its Tidd plant in Brilliant, O. It will supply carloads of coal to the dumper whose capacity is 800 tons an hour

ties in connection with the Diamond company will be limited to field service.

John Hewson Opens Chicago Office

John Hewson Co., New York, opened an office at 6349 N. Western, Chicago. Robert H. Metz Jr. is district manager. The company produces high-speed static controls and high-voltage insulation testers.

Hammond Iron Works Expands

Hammond Iron Works, Warren, Pa., will erect a major manufacturing facility in Ensley, Ala. The company, a large fabricator and erector of steel storage tanks, will let the general contract soon.

Baker-Raulang Names Distributor

Baker Industrial Truck Co. of Wisconsin was appointed by Baker-Raulang Co., Cleveland, as distributor of its industrial trucks and cranes in Milwaukee and eastern Wisconsin.

Foundry Supplier Moves Branch Office

American Wheelabrator & Equipment Corp., Mishawaka, Ind., moved its metropolitan New York district office to 53 Newark St. Bldg., Hoboken, N. J. The company makes foundry equipment, blasting abrasives, chemical and metallurgical dust and fume collectors.

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Wonderful opportunity. Must have excellent record of experience in fabricated structural steel sales. Must be thoroughly capable of making and supervising estimates. Engineering background highly desirable. Must have pleasant sales personality. For the right man this is a permanent position with a young, aggressive, growing organization in southern city of 250,000. Do not apply if you are not a top man. Write giving full details. Replies kept strictly confidential. **Write Box 622, STEEL, Penton Bldg., Cleveland 13, Ohio.**

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Excellent record of experience as chief or assistant chief estimator for structural steel fabricating shop necessary. Must be good organizer. Desirable (but not essential) if you can bring one or two good men with you. Fast growing company with unlimited opportunities for advancement and bonus. Located in the best part of the South. Only top men need apply. Write full details. Replies held strictly confidential. Expenses paid for interview trip at convenient time to main plant if your reply warrants. **Write Box 623, STEEL, Penton Bldg., Cleveland 13, Ohio.**

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OPEN TIME 300 TON PRESS BRAKE Will bend 20' x ¼" to 6' x ¾" Pl. **ST. JOSEPH STRUCTURAL STEEL CO.** Box 68 Sta. "A" St. Joseph, Mo.

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Purchasing agent. Must have excellent record of experience in structural steel field. Practical or college engineering background highly desirable. A permanent position with excellent salary, advancement prospects, and bonus. Location, South. Replies held confidential. Write Box 621, STEEL, Penton Bldg., Cleveland 13, Ohio.

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PLANT MANAGER: M.I.T. GRADUATE WITH 25 years' experience in Plant Management, including Production planning, machine and plant loading, Material and tool control, quality control, purchasing, incentives, standard costs, variable budgets, overhead analysis and break-even charts, job evaluation, supervisory responsibility chart and labor relations. Capable administrator with excellent record. Write Box 559, STEEL, Penton Bldg., Cleveland 13, Ohio.

MECHANICAL ENGINEER, 37, graduate, 15 years staff and supervisory experience new construction and general plant engineering including plant layout, machine design and specifications; particularly seamless and welded tube mill equipment. Desire position executive assistant or department head. Available six weeks after final negotiation. Responses held in strictest confidence. Reply to Box 611, STEEL, Penton Bldg., Cleveland 13, Ohio.

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Box, Double Sheathed, 50-Ton Capacity
Box, Single Sheathed, 50-Ton
Tank, 3,000-Gallon, High Pressure
Tank, 8,000-Gallon, Coiled and Non-Coiled
Gondolas, Composite, or All Steel 50-Ton and 70-Ton
Hoppers, Covered, All-Steel, 70-Ton
Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
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Box 620, STEEL,
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WE OFFER FOR SALE THE FOLLOWING:

2 only Progressive Welders,

Model 229E12H5, Serial Nos. 2801, and 2802

Bought July 1945

These are battery powered, air operated, rocker arm type welding machines, with a throat depth of 18".

The batteries are 12 cell Exide type M32 batteries of 660 amp. hour rate. The machines are rated at 25,000 amperes.

The maximum tip pressure at 80 lbs. psi line pressure is 1800 lbs. psi.

Equipped with 220 volt, 3 phase dry type Rectifiers.

The welders are equipped with electronic controls.

Batteries not included.

1 only Progressive Welder,

Model 229E30H7, Serial No. 2519.

Bought March 1945

This is a battery powered, rocker arm type welding machine with a throat depth of 30".

Progressive welder air operated DC Contactor, Weltronic Timer, Allen Unitron Rectifier.

This welder is operated by a 30 cell battery.

The maximum tip pressure at 80 lbs. psi line pressure is 4,000 lbs. psi.

Equipped with 220 volt, 3 phase dry type Rectifiers.

The welder is equipped with electronic controls.

Batteries not included.

WEST BEND ALUMINUM COMPANY
West Bend, Wisconsin

FOR SALE

2-TON HERROULT TILTING TYPE ELECTRIC STEEL FURNACE, side charge, inside dia. of shell 7'3", Transformer cap. 1000 to 1500 KVA at charge of 5000 to 6000#. Complete with 1500 KVA Transformer, 11000 2250 volts, 339 KVA Reactor, (3) Allis-Chalmers D.C. Generators with 7½ HP A.C. Motor 3 60 220-440, with extra head, carbon stick electrodes and heads, Serial #147, Electrode Control System installed new in 1947.

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All Lengths, Sections, all standard makes your job requires. Also Rent Pile Hammers, Pile Extractors.

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HIGH CARBON VANADIUM TOOL STEEL
WATER HARDENING—
ABRASIVE RESISTANT

1	13/16" Dia. Rd.	94,151 lbs.
1	15/16" Dia. Rd.	18,530 lbs.
2	15/16" Dia. Rd.	100,486 lbs.

STRAIGHT CARBON TOOL STEEL
WATER HARDENING

1	13/16" Dia. Rd.	6,125 lbs.
1	7/16" Dia. Rd.	5,035 lbs.

HOT WORK TOOL STEEL
FOR FORGING & DIE BLOCKS

8	5/8" Dia. Rd.	9,578 lbs.

Immediate Delivery From Stock
One pound or a carload
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Tinned stainless or carbon steel. In reels of 50 to 200 pounds. Stainless has high tensile strength, high resistance, low permeability.

☐ Lock Safety Wire

Tough, durable, workable. In the size and type for your work.

☐ Spring Wire

Any shape* . . . high carbon . . . hard drawn . . . high tensile . . . stainless . . . galvanized . . . tinned . . . bright.

*Cross-sectional areas up to .250" square; widths to 3/8"; width-to-thickness ratio not exceeding 6 to 1.

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PAGE STEEL AND WIRE DIVISION
AMERICAN CHAIN & CABLE

Monessen, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Portland, San Francisco, Bridgeport, Conn.

Pit To Hold 60,000 Tons of Presses

This foundation pit will hold the Air Force's 25,000 and 35,000-ton aluminum forging presses to be installed at Newark, O., for operation by Kaiser Aluminum & Chemical Corp. The two presses to occupy the pit will be part of a heavy press plant costing about $11.5 million, exclusive of the presses. It will include nine acres of buildings on the site of Kaiser's rod, bar, wire and cable works

Royal Metal Buys Plating Firm

Royal Metal Mfg. Co., Chicago, producer of chrome-plated metal furniture, steel shelving, hospital and hotel furniture, acquired Conneaut Plating Industries, Conneaut, O. The new facilities will furnish plated parts for other Royal Metal factories. About 20,000 sq ft is being added to the manufacturing space at its main factory in Michigan City, Ind.

Cold Metal Products Building Branch

Cold Metal Products Co., Youngstown, is building a branch plant at Indianapolis. Plant will cost $3.5 million to $4 million. The company makes cold-rolled strip.

U. S. Steel Warehouse Opens

United States Steel Supply Division, United States Steel Co., opened its fifteenth warehouse on Dec. 1 at 9500 Clinton Rd., nine miles southeast of Houston. The warehouse will carry complete stocks of steel, including bars, shapes, plates, strip and sheets in carbon, alloy and stainless grades.

More Aluminum Extrusions Planned

The Air Force will spend about $21 million to expand the Phoenix, Ariz., aluminum extrusion plant. The addition will increase floor space by 462,000 sq ft, or about 25 per cent. Construction will begin early next year and installation of equipment will take about a year. Productive capacity will be raised about one-third. A 12,000-ton and an 8000-ton extrusion press will be installed. The Air Force will own the building and contents, but Reynolds Metals Co., Louisville, will be responsible for operation.

Battery Firm Reclaims Mercury

General Dry Batteries Inc., Cleveland, reclaimed more than 45,000 lbs of mercury from used mercury hearing aid cells since its salvage drive started in March, 1951. Mercury accounts for about 50 per cent of the cost of a mercury hearing aid cell. Mercury is selling for about $200 per 76-lb flask compared with $71 before the Korean War broke out.

Wisconsin Motor Expands Plant

Wisconsin Motor Corp., Milwaukee, is expanding its facilities at an estimated cost of $350,000. The plant will have a total floor space of 291,000 sq ft, devoted exclusively to the manufacture of air-cooled engines. The company produced its two millionth engine on Nov. 12.

Tobin-Arp Moves Offices

Tobin-Arp Mfg. Co. moved its general offices to its plant No. 3 at 6400 Penn Ave., S. Minneapolis 23.

Clark Equipment Appoints Dealer

Clark Equipment Co., Buchanan, Mich., appointed Mississippi Supply Co., Chicago, as an authorized dealer in the railway field. Clark manufactures fork-lift trucks, industrial towing tractors, and battery-powered hand trucks.

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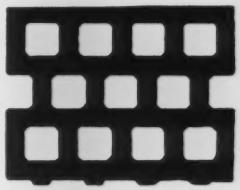
Perforated metal screens *for any requirement*



WITH facilities for producing any shape and size of perforations in any commercially rolled metal, of whatever gauge desired, Hendrick can furnish the most suitable form for a specific screening application.

To best meet certain requirements, Hendrick developed the "squaround" perforation illustrated. Other standard forms include round, square, hexagonal, diamond and slot perforations in hundreds of sizes of openings. Write for full information.

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Wedge-Slot Screens
Architectural Grilles
Mitco Open Steel Flooring,
Shur-Site Treads, Armorgrids

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INSTRUMENT MOUNTING

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Faster assembly . . . no more failures of fasteners. GREER STOP NUTS hold firm against jolts, shocks, shimmy, wobbles . . . any vibration, any kind.

Bolt threads are gripped tightly . . . these famous nuts *never* work loose. Yet an ordinary hand wrench gives instant release. The tough, built-in GREERCOID collar does it . . . and seals against fluid leakage, too!

Study *your* fastener problem. Over 3000 types and sizes. Consult GREER. Proved on thousands of products. Meets gov't and military specifications.

Write
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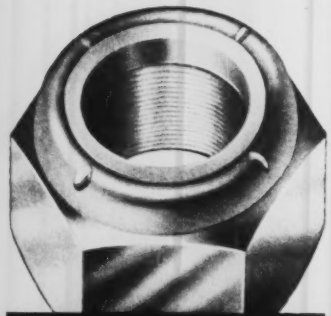
2620 Flournoy, Chicago 12, Ill.



GREER
Stop Nuts

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Farval helps McKay handle tough plate leveling jobs

FLATTENING heavy steel plates is always a tough job. The rollers that do the leveling and the bearings on which they run are built to take plenty of punishment.

To keep all bearings on its levelers functioning smoothly and efficiently, McKay employs Farval Centralized Lubrication. In fact, Farval has been standard equipment for many years on all the roller levelers and many other types of machines this company manufactures.

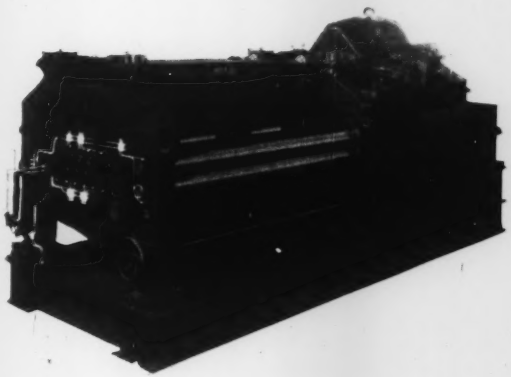
Farval assures that every bearing regularly gets the exact, measured amount of lubricant it requires. Special oilers are not needed, lubricant consumption is reduced, bearing life is extended indefinitely and shutdowns for oiling or bearing replacement are eliminated. In short, with Farval on the job, the purchaser of a McKay leveler is insured of getting all the value built into the machine by its manufacturer.

Farval is the original Dualine system of centralized lubrication for industrial equipment, proved practical in 25 years of service. The Farval valve has only two moving parts—is simple, sure and foolproof, without springs, ball-checks or pinhole ports to cause trouble. Through its full hydraulic operation, the Farval system unfailingly delivers oil or grease to each bearing—as much as you want, exactly measured—as often as desired. Indicators at all bearings show that each valve has functioned.

In or near your city there's a Farval engineer, ready to discuss your lubrication problems and suggest a proper system to meet your particular needs. The Farval Corporation, 3270 East 80th Street, Cleveland 4, Ohio.

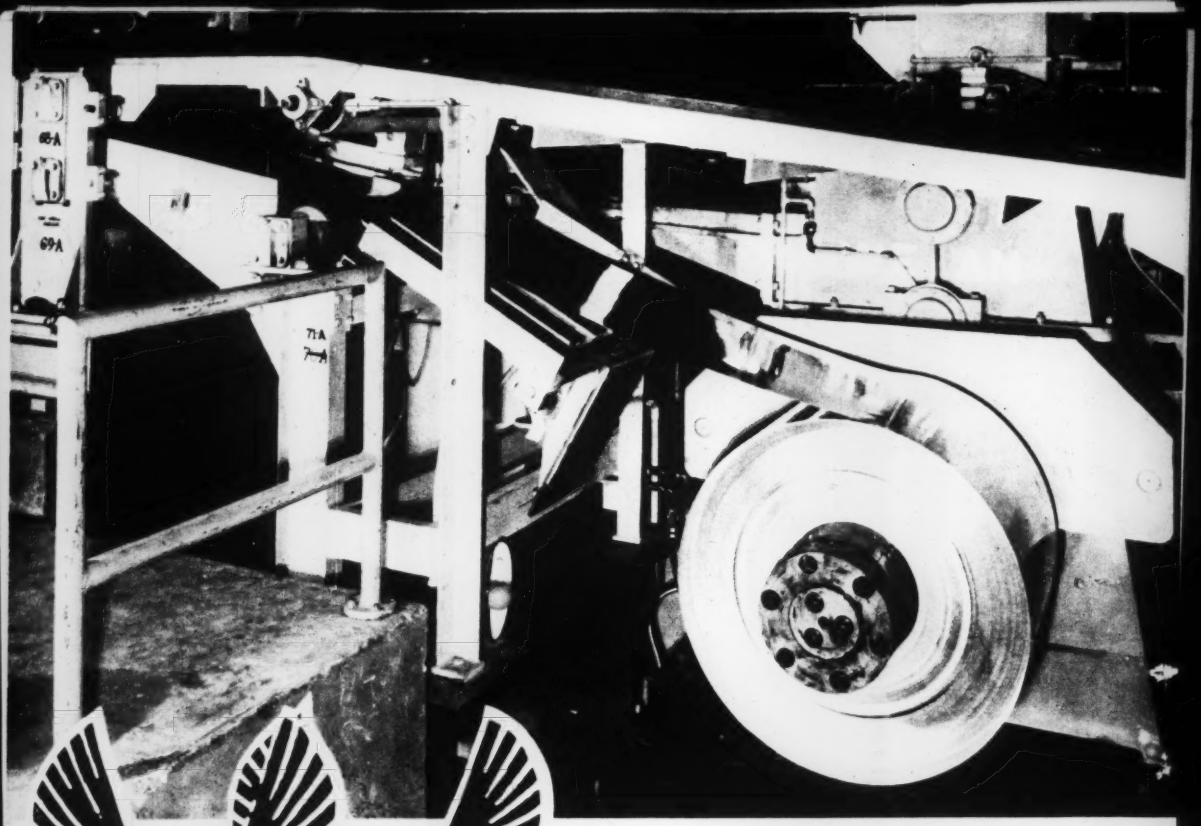
Affiliate of The Cleveland Worm and Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.

FARVAL—*Studies in Centralized Lubrication*
No. 129



KEYS TO ADEQUATE LUBRICATION—*Whenever you see the sign of Farval—the familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine is being properly lubricated. Farval manually operated and automatic systems protect millions of industrial bearings.*

Photo above by courtesy of The McKay Machine Company.



WEAN

electrolytic tinning

The Wean Engineering Company is meeting today's demands for equipment to produce tin plate and zinc coated strip steel with light coatings by the electrolytic method; also equipment to produce chemically treated black plate and strip steel. Equipment for coating strip steel with zinc and other materials by the hot dip method is also available.

The WEAN ENGINEERING COMPANY, INC.

WARREN, OHIO

SPECIALISTS IN SHEET, TIN, AND STRIP MILL EQUIPMENT